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**UTILITY PATENT  
APPLICATION TRANSMITTAL**(Only for new nonprovisional applications  
under 37 CFR 1.53(b))

Attorney Docket No.

**000993**

Total Pages

First Named Inventor or Application Identifier

**Kenichi HARUKI, Taisuke INOUE, Hidehiko FUCHIDA,  
Katsuhito KANBE, Tsuyoshi NIWATA and Masuo OHNISHI**

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APPLICATION ELEMENTS FOR:  
**EXTENSION DEVICE PROVIDING SECURITY  
FUNCTION**ADDRESS TO: Director of Patents and Trademarks  
BOX PATENT APPLICATIONS  
Washington, D.C. 20231

1. ☒ Fee Transmittal Form (Incorporated within this form)  
(Submit an original and a duplicate for fee processing)
2. ☒ Specification Total Pages [94]
3. ☒ Drawing(s) (35 USC 113) Total Sheets [34]
4. ☒ Oath or Declaration Total Pages [6]
  - a. ☒ Newly executed (original)
  - b. ☐ Copy from prior application (37 CFR 1.63(d)  
(for continuation/divisional with Box 17 completed).
    - i. ☐ Deletion of Inventor(s)  
Signed statement attached deleting inventor(s) named in prior application,  
see 37 CFR 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation by reference (useable if box 4b is checked)  
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under  
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby  
incorporated by reference therein.
6. ☐ Microfiche Computer Program (Appendix)
7. ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
  - a. ☐ Computer Readable Copy
  - b. ☐ Paper Copy (identical to computer copy)
  - c. ☐ Statement Verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

8. ☒ Assignment Papers (cover sheet and document(s))
9. ☐ 37 CFR 3.73(b) Statement (when there is an assignee) ☒ Power of Attorney

# UTILITY PATENT APPLICATION TRANSMITTAL

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PAGE 2 OF 3

10. ☐ English translation Document (if applicable)

11. ☐ Information Disclosure Statement ☐ Copies of IDS Citations

12. ☐ Preliminary Amendment

13. ☒ Return Receipt Postcard (MPEP 503)

14. ☐ Small Entity Statement(s) ☐ Statement filed in prior application  
Status still proper and desired.

15. ☐ Claim for Convention Priority ☐ Certified copies of Priority Documents

a. Priority of \_\_\_\_\_ application no. \_\_\_\_\_ filed on \_\_\_\_\_ is claimed under 35 USC 119.

The certified copies/copy have/has been filed in prior application Serial No. \_\_\_\_\_.

(For Continuing Applications, if applicable).

16. ☐ Other \_\_\_\_\_

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Division ☐ Continuation-in-part (CIP) of prior application no. \_\_\_\_/\_\_\_\_

FEE TRANSMITTAL	Number Filed	Number Extra	Rate	Basic . . Fee
The filing fee is calculated below				\$690.00
Total Claims	33 - 20	13	x \$18.00	\$ 234.00
Independent Claims	7 - 3	4	x \$78.00	\$ 312.00
Multiple Dependent Claims			\$260.00	
Basic Filing Fee				\$1236.00
Reduction by 1/2 for small entity				
Fee for recording enclosed Assignment			\$40.00	\$ 40.00
TOTAL				\$1276.00

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APPLICATION TRANSMITTAL**

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**PAGE 3 OF 3**

☒ [XX] A check in the amount of \$1276.00 is enclosed to cover the filing fee of \$1236.00 and the assignment recordation fee of \$40.00.

☐ [ ] Please charge our Deposit Account No. **01-2340** in the total amount of \_\_\_\_\_ to cover the filing fee and the \_\_\_\_\_ assignment recordation fee. A duplicate of this sheet is attached.

☒ [XX] The Commissioner is hereby authorized to charge payment for any additional filing fees required under 37 CFR 1.16 or credit any overpayment to Deposit Account No. **01-2340**. A duplicate of this sheet is attached.

**18. CORRESPONDENCE ADDRESS**

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**SUBMITTED BY**

Typed or Printed Name **William F. Westerman**

Reg. No. 29,988

Signature

Date: August 16, 2000

WFW/II

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT WE, Kenichi Haruki, a citizen of Japan residing at Kawasaki, Japan, Taisuke Inoue, a citizen of Japan residing at Kawasaki, Japan, Hidehiko Fuchida, a citizen of Japan residing at Kawasaki, Japan, Katsuhito Kanbe, a citizen of Japan residing at Kawasaki, Japan, Tsuyoshi Niwata, a citizen of Japan residing at Kawasaki, Japan and Masuo Ohnishi, a citizen of Japan residing at Kawasaki, Japan have invented certain new and useful improvements in

EXTENSION DEVICE PROVIDING SECURITY FUNCTION

of which the following is a specification : -

**TITLE OF THE INVENTION**

EXTENSION DEVICE PROVIDING SECURITY  
FUNCTION

5 **BACKGROUND OF THE INVENTION**

1. Field of the Invention

The present invention relates to an  
extension device providing a security function or an  
identification-information-acquisition function for  
10 an information processing device or an electronic  
device.

As a result of recent development of open  
network technologies in this information age, more  
investments than ever are made in information  
15 infrastructures, resulting in widespread use of  
networks and the Internet. Against this background,  
mobile information processing devices such as  
notebook personal computers, laptop personal  
computers, and mobile terminals are used in many  
20 different settings, and so are installed-type  
information processing devices such as desktop  
personal computers. In such an environment, an  
importance for security is heightened in order to  
prevent private information stored in the device  
25 from being exposed to unauthorized users.

In prior art, owners or authorized users  
of information processing devices used passwords,  
IDs, personal-identification-number (PIN) codes for  
identification purposes. The use of passwords, IDs,  
30 PIN codes, however, is cumbersome since it requires  
users to remember them and to enter them whenever  
they are required. Further, use of passwords, IDs,  
and PIN codes always carries a risk of having them  
stolen.

35 As an alternative to passwords, IDs, and  
PIN codes, biological information unique to each  
individual such as fingerprints is used in some

devices.

## 2. Description of the Related Art

Figs.1A and 1B show illustrative drawings showing a card-type fingerprint identification device 1 that is commercialized by FUJITSU DENSO LIMITED. Fig.1A shows the card-type fingerprint identification device 1, and Fig.1B shows a notebook personal computer 10 (or a portable-information-processing device, hereinafter referred to as a notebook-type personal computer) that has the card-type fingerprint identification device 1 inserted therein.

The card-type fingerprint identification device 1 includes a fingerprint identification unit 2 for identifying a fingerprint and a PCMCIA (personal computer memory card international association) card 3. As shown in Fig.1B, the card-type fingerprint identification device 1 is used while the PCMCIA card 3 thereof is inserted into a PCMCIA-card slot 11, which is provided in the side panel of the notebook personal computer 10. The fingerprint identification unit 2 sticks out from the side panel of the notebook personal computer 10.

When a user needs to carry an notebook personal computer 10 outside the office, the fingerprint identification unit 2 sticking out from the side panel is too much encumbrance. Because of this, the card-type fingerprint identification device 1 needs to be detached from the notebook personal computer 10 and be carried separately from the notebook personal computer 10. This is inconvenient.

Accordingly, there is a need for an extension device which provides an identification-information-acquisition function or a security function for an information processing device without sacrificing portability of the device.

SUMMARY OF THE INVENTION

It is a general object of the present invention to provide an extension device that  
5 substantially obviates one or more of the problems caused by the limitations and disadvantages of the related art.

Features and advantages of the present invention will be set forth in the description which  
10 follows, and in part will become apparent from the description and the accompanying drawings, or may be learned by practice of the invention according to the teachings provided in the description. Objects as well as other features and advantages of the  
15 present invention will be realized and attained by an extension device particularly pointed out in the specification in such full, clear, concise, and exact terms as to enable a person having ordinary skill in the art to practice the invention.

20 To achieve these and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, the invention provides an extension device having such a configuration as to be mounted in an extension bay  
25 of an information processing device and including an identification-information-acquisition unit.

The extension device described above is mounted in the extension bay of the information processing device such that the extension device can  
30 be carried with the information processing device as an integral part of the information processing device. If the extension device is so configured as not to stick out from the information processing device, portability is further improved. This  
35 configuration is particularly advantageous if the information processing device is of a portable type. Further, in the case where the extension bay of the

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information processing device is configured to store therein any one of a plurality of different types of extension devices, the identification-information-acquisition unit mounted in the extension bay is  
5 freely exchangeable with other extension devices, thereby helping to achieve compactness and expandability of the information processing device. As the identification-information-acquisition unit, various types of units can be employed, such units  
10 including a fingerprint-detection (fingerprint-input) unit, a voice (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), and a facial-image/feature input unit (such as a CCD  
15 camera acquiring an image of a user face), all of which utilize biological information as identification information. Further, the identification-information-acquisition unit may be a key-input unit which allows an individual ID, a  
20 personal-identification-number code, or a password to be entered through typing of keys. Further, a unit may be provided for the purpose of reading an ID card such as a magnetic card or an IC card. The present invention is not limited to use of a  
25 particular type of identification information.

According to one aspect of the present invention, the identification-information-acquisition unit includes a biological-information-acquisition unit for acquiring biological  
30 information. As previously described, the biological information used in the present invention may include voice (voice pattern), retinal patterns, handwritings, facial images or features, etc. In such a case, the acquisition unit may be a voice  
35 (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), or a facial-image/feature



input unit (such as a CCD camera acquiring an image of a user face). Biological information is unique to individuals, and carries a smaller risk of unauthorized use or forgery than in the case where  
5 identification is checked based on an ID card such as a magnetic card or a personal-identification-number code. An ID card may be stolen, and a PIN code may be illegally accessed by others, resulting in unauthorized use thereof. Use of biological  
10 information thus heightens security. Further, providing the biological-information-acquisition unit in the extension device can improve security of the information processing device having an extension bay.

15 According to another aspect of the present invention, the identification-information-acquisition unit includes an ID-card-reader unit for reading an ID card. Provision of the ID-card-reader unit in the extension device makes it possible to  
20 carry the ID-card reader together with the information processing device as an integral part thereof. Since the ID-card-reader unit does not stick out from the information processing device, the configuration described above provides better  
25 portability.

According to another aspect of the present invention, the identification-information-acquisition unit includes a personal-identification-number-entry unit for receiving a personal-  
30 identification-number code. The extension device can be mounted in the extension bay of the information processing device such that the extension device can be carried with the information processing device as an integral part of the  
35 information processing device. If the extension device is so configured as not to stick out from the information processing device, portability is

According to another aspect of the invention, the biological information includes one of fingerprints, retinal patterns, voice, handwritings, and facial features. Such biological information is unique to individual users, and is not easy to steal or forge. Difficulty of forgery heightens security. When entering biological information in the information processing device, a user does not need to carry with him/her a special device such as a card, and does not have to remember a PIN code or the like. This frees the user from encumbrance of entry of identification information.

According to another aspect of the present invention, the extension device includes a matching unit which matches identification information entered in the identification-information-acquisition unit with registered identification information. This configuration makes it possible for the extension device to check identification.

According to another aspect of the present invention, an extension device having such a

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facial-image/feature input unit (such as a CCD camera acquiring an image of a user face), all of which utilize biological information as identification information. Further, the  
5 identification-information-acquisition unit may be a key-input unit which allows an individual ID, a personal-identification-number code, or a password to be entered through typing of keys. Further, a unit may be provided for the purpose of reading an  
10 ID card such as a magnetic card or an IC card. The present invention is not limited to use of a particular type of identification information.

According to another aspect of the present invention, the identification-information-  
15 acquisition unit includes a biological-information-acquisition unit for acquiring biological information. As previously described, the biological information used in the present invention may include voice (voice pattern), retinal patterns,  
20 handwritings, facial images or features, etc. In such a case, the acquisition unit may be a voice (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), or a facial-image/feature  
25 input unit (such as a CCD camera acquiring an image of a user face). Biological information is unique to individuals, and carries a smaller risk of unauthorized use or forgery than in the case where identification is checked based on an ID card such  
30 as a magnetic card or a personal-identification-number code. Use of biological information thus heightens security.

According to another aspect of the present invention, the biological information includes one  
35 of fingerprints, retinal patterns, voice, handwritings, and facial features. Such biological information is unique to individual users, and is

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not easy to steal or forge. Difficulty of forgery heightens security. When entering biological information in the information processing device, a user does not need to carry with him/her a special device such as a card, and does not have to remember a PIN code or the like. This frees the user from encumbrance of entry of identification information.

According to another aspect of the present invention, the identification-information-acquisition unit is configured to be detachable from the carrier unit. In this manner, it is possible to use the identification-information-acquisition unit while it is being detached from the carrier unit.

According to another aspect of the present invention, the identification-information-acquisition unit is connectable to the information processing device through a cable when the identification-information-acquisition unit is detached from the carrier unit. This cable preferably connects the identification-information-acquisition unit to the information processing unit electrically or optically such as to achieve data transfer. Since the identification-information-acquisition unit is usable through the cable connection while it is being detached from the information processing device, there is no need to let the identification-information-acquisition unit slide out from the information processing device each time the unit is to be used while the device is placed on a desk or the like. This ensures ease of use of the device.

According to another aspect of the present invention, the identification-information-acquisition unit includes a left-hand-side connector which is to be connected to the extension device when the extension device is mounted in a left-hand side of the information processing device, and a

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Further, the use of the cable extending from the identification-information-acquisition unit eliminates a need to secure a separate storage for the cable.

5                   According to another aspect of the present invention, the extension device includes an operation unit which prompts the carrier unit to engage in first motion to situate the identification-information-acquisition unit at a  
10 position that is barely sufficient for identification information to be entered in the identification-information-acquisition unit, and prompts the carrier unit to engage in second motion to expose an entirety of the identification-  
15 information-acquisition unit outside the container portion. When properly operated, the operation unit exposes the entirety of the identification-information-acquisition unit outside the container portion, so that it is easy to take the  
20 identification-information-acquisition unit out of the container portion.

                  According to another aspect of the present invention, an identification-information-acquisition device to be detachably mounted in an extension  
25 device which has such a configuration as to be mounted in a container portion of an information processing device, and which includes a carrier unit that moves from a position where the carrier unit is encased in the container portion to a position where  
30 the carrier unit is situated outside the container portion, includes an identification-information-acquisition unit which receives identification information, wherein the carrier unit moves the identification-information-acquisition unit from an  
35 encased position to a position where the identification information can be entered in the identification-information-acquisition unit when the

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identification-information-acquisition device is mounted on the carrier unit. An example of the container portion is an extension bay. Since the identification-information-acquisition unit can be detached from the carrier unit, the user can use the identification-information-acquisition unit while it is detached, and can also use the identification-information-acquisition unit while it is placed in the encased position. When the information processing device is to be carried, the identification-information-acquisition unit can be stored in the container portion, thereby providing better portability. In the case where the container portion (e.g., extension bay) of the information processing device is configured to store therein any one of a plurality of different types of extension devices, the identification-information-acquisition unit mounted in the extension bay is freely exchangeable with other extension devices, thereby helping to achieve compactness and expandability of the information processing device. As the identification-information-acquisition unit, various types of units can be employed, such units including a fingerprint-detection (fingerprint-input) unit, a voice (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), and a facial-image/feature input unit (such as a CCD camera acquiring an image of a user face), all of which utilize biological information as identification information. Further, the identification-information-acquisition unit may be a key-input unit which allows an individual ID, a personal-identification-number code, or a password to be entered through typing of keys. Further, a unit may be provided for the purpose of reading an ID card such as a magnetic card or an IC card. The present



invention is not limited to use of a particular type of identification information.

According to another aspect of the present invention, the identification-information-acquisition unit includes a biological-information-acquisition unit for acquiring biological information. As previously described, the biological information used in the present invention may include voice (voice pattern), retinal patterns, handwritings, facial images or features, etc. In such a case, the acquisition unit may be a voice (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), or a facial-image/feature input unit (such as a CCD camera acquiring an image of a user face). Biological information is unique to individual users, and carries a smaller risk of unauthorized use or forgery than in the case where identification is checked based on an ID card such as a magnetic card or a personal-identification-number code. Use of biological information thus heightens security.

According to another aspect of the present invention, the biological information includes one of fingerprints, retinal patterns, voice, handwritings, and facial features. Such biological information is unique to individual users, and is not easy to steal or forge. Difficulty of forgery heightens security. When entering biological information in the information processing device, a user does not need to carry with him/her a special device such as a card, and does not have to remember a PIN code or the like. This frees the user from encumbrance of entry of identification information.

According to another aspect of the present invention, an information processing device includes a case, an identification-information-acquisition

35           According to another aspect of the present  
invention, the identification-information-  
acquisition unit includes a biological-information-

acquisition unit for acquiring biological information. As previously described, the biological information used in the present invention may include voice (voice pattern), retinal patterns, 5 handwritings, facial images or features, etc. In such a case, the acquisition unit may be a voice (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), or a facial-image/feature 10 input unit (such as a CCD camera acquiring an image of a user face). Biological information is unique to individual users, and carries a smaller risk of unauthorized use or forgery than in the case where identification is checked based on an ID card such 15 as a magnetic card or a personal-identification-number code. Use of biological information thus heightens security.

According to another aspect of the present invention, the biological information includes one 20 of fingerprints, retinal patterns, voice, handwritings, and facial features. Such biological information is unique to individual users, and is not easy to steal or forge. Difficulty of forgery heightens security. When entering biological 25 information in the information processing device, a user does not need to carry with him/her a special device such as a card, and does not have to remember a PIN code or the like. This frees the user from encumbrance of entry of identification information.

30 According to another aspect of the present invention, the identification-information-acquisition unit is configured to be detachable from the carrier unit. In this configuration, it is possible to use the identification-information- 35 acquisition unit while it is being detached from the carrier unit.

According to another aspect of the present

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invention, an identification-information-acquisition device to be detachably mounted in an information processing device which includes a carrier unit that moves from a position where the carrier unit is encased in the information processing device to a position where the carrier unit is exposed outside the information processing device, includes an identification-information-acquisition unit which receives identification information, wherein the carrier unit moves the identification-information-acquisition unit from an encased position to a position where the identification information can be entered in the identification-information-acquisition unit when the identification-information-acquisition device is mounted on the carrier unit. Since the identification-information-acquisition unit can be detached from the carrier unit, the user can use the identification-information-acquisition unit while it is detached, and can also use the identification-information-acquisition unit while it is placed in the encased position. When the information processing device is to be carried, the identification-information-acquisition unit can be stored and encased in the information processing device, thereby providing better portability. As the identification-information-acquisition unit, various types of units can be employed, such units including a fingerprint-detection (fingerprint-input) unit, a voice (voice-pattern) input unit, a retinal-pattern-input unit, a handwriting-input unit (such as a pen-input device or a touch pad), and a facial-image/feature input unit (such as a CCD camera acquiring an image of a user face), all of which utilize biological information as identification information. Further, the identification-information-acquisition unit may be a key-input unit which allows an individual ID, a



encumbrance of entry of identification information.

According to another aspect of the present invention, the identification-information-acquisition unit is configured to be detachable from the carrier unit. In this configuration, it is possible to use the identification-information-acquisition unit while it is detached from the carrier unit.

According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay of an information processing device, and provides a security function.

When mounted in the extension bay of the information processing device, the device as described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly advantageous when the information processing device is of a portable type.

According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay of an information processing device, and provides a function to detect a fingerprint.

When mounted in the extension bay of the information processing device, the device as described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly advantageous when the information processing device is of a portable type.

According to another aspect of the present

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invention, the fingerprint-reading unit includes a left-hand-side connector which is to be connected to the extension device when the extension device is mounted in a left-hand side of the information processing device, and a right-hand-side connector which is to be connected to the extension device when the extension device is mounted in a right-hand side of the information processing device.

Because of this configuration, the fingerprint-reading unit will be usable with an extension device that would be available in the future and mountable to the right-hand side of an information processing device.

According to another aspect of the present invention, the fingerprint-reading unit includes a cable having a connector provided at a tip thereof, the fingerprint-reading unit being connectable to a connector of the extension device via the cable when the fingerprint-reading unit is attached to the carrier unit, and being connectable to the information processing device via the cable when the fingerprint-reading unit is detached from the carrier unit.

Since the fingerprint-reading unit is usable via the cable connection while it is being detached from the information processing device, there is no need to let the fingerprint-reading unit slide out from the information processing device each time the unit is to be used while the device is placed on a desk or the like. This ensures ease of use of the device. Further, the use of the cable extending from the fingerprint-reading unit eliminates a need to secure a separate storage for the cable.

According to another aspect of the present invention, the fingerprint-reading unit is detachable from the tray, and includes a housing,



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When mounted in the extension bay of the information processing device, the device as described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. Since the carrier unit makes the fingerprint-identification unit slide out to the exposed position where a fingerprint can be detected, it is easy to prepare appropriate positioning for fingerprint detection, thereby securing ease of use.

According to another aspect of the present invention, the fingerprint-identification unit is detachable from the carrier unit.

In this configuration, it is possible to use the fingerprint-identification unit while it is detached from the carrier unit.

According to another aspect of the present invention, the fingerprint-identification unit is configured to be electrically connected to the information processing device through a cable while it is detached from the carrier unit.

Since it is possible to use the detached fingerprint-identification unit through the cable connection, there is no need to let the fingerprint-identification unit slide out from the information processing device each time the unit is to be used while the device is placed on a desk or the like. This ensures ease of use of the device.

According to another aspect of the present invention, the fingerprint-identification unit includes a left-hand-side connector which is to be connected to the extension device when the extension device is mounted in a left-hand side of the information processing device, and a right-hand-side connector which is to be connected to the extension device when the extension device is mounted in a

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right-hand side of the information processing device.

Because of this configuration, the fingerprint-identification unit will be usable with an extension device that would be available in the future and mountable to the right-hand side of an information processing device.

According to another aspect of the present invention, the fingerprint-identification unit includes a front-side connector which is to be connected to the extension device when the extension device is mounted in a front side of the information processing device. Because of this configuration, the fingerprint-identification unit can be used with an extension device that is mounted in a front side of an information processing device.

According to another aspect of the present invention, the fingerprint-identification unit includes a cable having a connector provided at a tip thereof, the fingerprint-identification unit being connectable to a connector of the extension device via the cable when the fingerprint-identification unit is attached to the carrier unit, and being connectable to the information processing device via the cable when the fingerprint-identification unit is detached from the carrier unit.

Since the fingerprint-identification unit is usable via the cable connection while it is being detached from the information processing device, there is no need to let the fingerprint-identification unit slide out from the information processing device each time the unit is to be used while the device is placed on a desk or the like. This ensures ease of use of the device. Further, the use of the cable extending from the fingerprint-identification unit eliminates a need to secure a separate storage for the cable.

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According to another aspect of the present invention, the fingerprint-identification unit is detachable from the carrier unit, and the extension device includes an operation unit which prompts the carrier unit to engage in first motion to situate the fingerprint-identification unit at a position that is barely sufficient for identification information to be entered in the fingerprint-identification unit, and prompts the carrier unit to engage in second motion to expose an entirety of the fingerprint-identification unit outside the information processing device.

When properly operated, the operation unit exposes the entirety of the fingerprint-identification unit outside the information processing device, so that it is easy to take the fingerprint-identification unit out of the carrier unit.

According to another aspect of the present invention, a fingerprint-reading unit is equipped with a connector, and has generally a box shape and a fingerprint-detection function.

The fingerprint-reading unit described above can be used with an extension device, or can be used alone.

According to another aspect of the present invention, a fingerprint-reading unit is equipped with a cable having a connector provided at a tip thereof, and has generally a box shape and a fingerprint-detection function.

The fingerprint-reading unit described above can be used with an extension device, or can be used alone. When used alone, the unit does not need an extra cable since it has the cable already attached thereto.

According to another aspect of the present invention, a fingerprint-identification-check unit

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is equipped with a connector, and has generally a box shape and a fingerprint-identification-check function.

5 The fingerprint-identification-check unit described above can be used with an extension device, or can be used alone.

10 According to another aspect of the present invention, a fingerprint-identification-check unit is equipped with a cable having a connector provided at a tip thereof, and has generally a box shape and a fingerprint-identification-check function.

15 The fingerprint-reading unit described above can be used with an extension device, or can be used alone. When used alone, the unit does not need an extra cable since it has the cable already attached thereto.

20 According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay of an information processing device, and has a fingerprint-detection function.

25 When mounted in the extension bay of the information processing device, the device as described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly advantageous when the information processing device is of a portable type.

30 According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay of an information processing device, and has a fingerprint-detection function implemented on a side panel of the extension device that is exposed when the extension device is mounted in the extension bay.

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When mounted in the extension bay of the information processing device, the device as described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly advantageous when the information processing device is of a portable type. Further, since the fingerprint-detection function is provided on the side panel that is exposed when the extension device is mounted in the extension bay, it is easy to access the fingerprint-detection function, providing ease of use of the extension device.

According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay of an information processing device, and has an ID-card-reader unit.

When mounted in the extension bay of the information processing device, the device as described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly advantageous when the information processing device is of a portable type.

According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay of an information processing device, and has an ID-card-reader unit implemented on a side panel of the extension device that is exposed when the extension device is mounted in the extension bay.

When mounted in the extension bay of the information processing device, the device as

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described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better

5 portability. This configuration is particularly advantageous when the information processing device is of a portable type. Further, since the ID-card-reader unit is provided on the side panel that is exposed when the extension device is mounted in the

10 extension bay, it is easy to access the ID-card-reader unit, providing ease of use of the extension device.

According to another aspect of the present invention, an extension device has such a

15 configuration as to be mounted in an extension bay of an information processing device, and has a PIN-code-input unit.

When mounted in the extension bay of the information processing device, the device as

20 described above can be carried together with the information processing device as an integral part thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly

25 advantageous when the information processing device is of a portable type.

According to another aspect of the present invention, an extension device has such a configuration as to be mounted in an extension bay

30 of an information processing device, and has an PIN-code-input unit implemented on a side panel of the extension device that is exposed when the extension device is mounted in the extension bay.

When mounted in the extension bay of the

35 information processing device, the device as described above can be carried together with the information processing device as an integral part

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thereof, and does not stick out from the information processing device, thereby providing better portability. This configuration is particularly advantageous when the information processing device is of a portable type. Further, since the PIN-code-input unit is provided on the side panel that is exposed when the extension device is mounted in the extension bay, it is easy to access the PIN-code-input unit, providing ease of use of the extension device.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

Figs.1A and 1B show illustrative drawings showing a related-art card-type fingerprint identification device;

Fig.2 is an illustrative drawing showing an extension device of the present invention in relation with a notebook personal computer;

Fig.3 is an illustrative drawing showing a fingerprint-reading extension device of a first embodiment of the present invention in relation with an extension bay of a notebook personal computer;

Fig.4 is an exploded view of the fingerprint-reading extension device of Fig.3;

Fig.5 is a plan view of the fingerprint-reading extension device with a cover thereof removed;

Figs.6A and 6B are illustrative drawings showing a fingerprint-reading unit of Fig.4;

Figs.7A through 7C are illustrative drawings showing the fingerprint-reading unit;

Fig.8 is a block diagram showing functions of the fingerprint-reading unit and a notebook personal computer;

Fig.9 is an illustrative drawing showing the way the fingerprint-reading unit is partly slid out from the notebook personal computer;



Fig.10 is a plan view of the fingerprint-reading unit for showing the way the fingerprint-reading unit is partly slid out from the notebook personal computer;

5 Fig.11 is a plan view of the fingerprint-reading unit for showing the way the fingerprint-reading unit is fully slid out from the notebook personal computer;

10 Fig.12 is an illustrative drawing showing the fingerprint-reading unit connected to the notebook personal computer via a cable;

Fig.13 is an illustrative drawing showing a fingerprint-reading extension device according to a second embodiment of the present invention;

15 Fig.14 is a block diagram showing functions of the fingerprint-reading unit of Fig.13 and a notebook personal computer;

20 Fig.15 is an illustrative drawing showing a fingerprint-reading extension device according to a third embodiment of the present invention

Fig.16 is a block diagram showing functions of the fingerprint-reading unit of Fig.15 and a notebook personal computer;

25 Fig.17 is an illustrative drawing showing a fingerprint-reading extension device according to a fourth embodiment of the present invention

Fig.18 is an exploded view of the fingerprint-reading extension device of Fig.17;

30 Figs.19A and 19B are illustrative drawings showing a fingerprint-reading unit shown in Fig.18;

Fig.20 is an illustrative drawing showing the way the fingerprint-reading unit is partly slid out from the notebook personal computer;

35 Fig.21 is an illustrative drawing showing the fingerprint-reading unit connected to the notebook personal computer via a cable;

Fig.22 is an illustrative drawing showing

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a fingerprint-reading extension device according to a fifth embodiment of the present invention;

Fig.23 is an illustrative drawing showing an IC-card-reader extension device according to a sixth embodiment of the present invention;

Fig.24 is a block diagram showing functions of the IC-card-reader extension device of Fig.23 and a notebook personal computer;

Fig.25 is an illustrative drawing showing a magnetic-card-reader extension device according to a seventh embodiment of the present invention;

Fig.26 is a block diagram showing functions of the magnetic-card-reader extension device of Fig.25 and a notebook personal computer;

Fig.27 is an illustrative drawing showing a PIN-input extension device according to an eighth embodiment of the present invention; and

Fig.28 is a block diagram showing functions of the PIN-code-input extension device of Fig.27 and a notebook personal computer.

Fig.29 is an illustrative drawing showing a fingerprint-reading unit stored in an information processing device according to a ninth embodiment of the present invention;

Fig.30 is an illustrative drawing showing the fingerprint-reading unit sticking out from the information processing device according to the ninth embodiment of the present invention;

Fig.31 is a block diagram showing relations between the fingerprint-reading unit and the information processing device shown in Fig.29 and Fig.30;

Fig.32 is an illustrative drawing showing an extension device of another embodiment of the present invention together with a notebook personal computer;

Fig.33 is an exploded view of the

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fingerprint-reading extension device; and

Figs.34A and 34B are isometric views of a fingerprint-reading unit shown in Fig.33.

5 **DESCRIPTION OF THE PREFERRED EMBODIMENTS**

In the following, embodiments of the present invention will be described with reference to the accompanying drawings.

To facilitate the understanding of the  
10 present invention, a description will be first given with regard to relation between an identification-information-acquisition device or an instrument of security function (for example, a fingerprint-reading extension device) and other extension  
15 devices such as a floppy drive as well as with regard to relation between the fingerprint-reading extension device and a notebook personal computer.

In the following description of  
embodiments, for the sake of convenience, the  
20 information processing device will be simply referred to as a notebook personal computer. The information processing device of the present invention, however, includes any portable-type device such as a portable information processing  
25 device or a mobile terminal. Further, the term "computer" is used to refer to a device equipped with a processor, a device that performs any kind of information processing, or a device that performs any act (storing of data, communication, etc.) that  
30 relates to information processing.

Fig.2 is an illustrative drawing showing an extension device of the present invention in relation with a notebook personal computer.

A notebook personal computer 20 includes a  
35 computer body 21 exemplifying a case or housing, and further includes a liquid-crystal-display unit 27 serving as a display unit that can be swung open to

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show a display screen. A direction X1-X2 corresponds to the width of the notebook personal computer 20. A direction Y1-Y2 corresponds to the depth of the notebook personal computer 20, and a direction Z1-Z2 corresponds to the height of the notebook personal computer 20. The computer body 21 has a keyboard portion 22 provided on an upper surface thereof and serving as an input unit, and has a CPU 23 or a processor contained therein. Further, the computer body 21 has an extension bay 24 that serves as a container. The extension bay 24 occupies about half the extension of the computer body 21 in the direction X1-X2, and is provided on the left-hand side so as to have an opening 26 in a side panel 25 of the computer body 21.

The notebook personal computer 20 can be used with various extension devices such as an extension floppy drive 30, an extension CD-ROM drive 40, extension devices having an identification-information-acquisition function or providing a security function (for example, fingerprint-reading extension devices 50, 50A, 50B, 50C, and 50D) corresponding to first through fourth embodiments of the present invention, a fingerprint-reading extension device 80 (or fingerprint-identification device) corresponding to a fifth embodiment, an IC-card-reader extension device 90 (or IC-card-identification extension device) of a sixth embodiment, a magnetic-card-reader extension device 100 (or magnetic-card-identification extension device) of a seventh embodiment, and a PIN-input extension device 110 (or PIN-identification extension device) of an eighth embodiment.

These extension devices have a flat shape that can fit in the extension bay 24 through the opening 26, and have respective connectors 31, 41, 51, 81, 91, 101, 111 at the same position on the

back side.

The core circuit 30 includes a turn table 32 and a magnetic-head device 33, and has an slit opening 34 in a front panel facing the direction X2.

5 The extension CD-ROM drive 40 includes a turn table 42 and an optical-head device 43 provided on a drawer unit 44.

10 When the notebook personal computer 20 is to be used with a floppy disk, the extension floppy drive 30 is inserted and set in place in the extension bay 24. A floppy disk 35 is inserted into the slit opening 34 to be mounted in the extension floppy drive 30.

15 When the notebook personal computer 20 is to be used with a CD-ROM, the extension CD-ROM drive 40 is inserted and set in place in the extension bay 24. A CD-ROM 45 is placed on the turn table 42 after sliding out the drawer unit 44. When the drawer unit 45 is pushed in into its place,  
20 information recorded on the CD-ROM 45 will be read.

Other extension devices 50, 50A, 50B, 50C, 50D, 80, 90, 100, and 110 may be mounted in the extension bay 24 when the notebook personal computer 20 is taken out of office. The manner in which  
25 these extension devices are mounted in the extension bay 24 is basically the same as the manner in which the extension floppy drive 30 or the extension CD-ROM drive 40 is mounted.

The extension bay 24 exemplifying a  
30 container unit of the present invention is referred to by many different names. Those names include a bay, an extension bay slot, a multi bay, a multi-purpose bay, etc.

35 [First Embodiment]

In what follows, an extension device having an identification-information-acquisition

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function or providing a security function (for example, the fingerprint-reading extension device 50) of the first embodiment will be described.

Fig.3 is an illustrative drawing showing the fingerprint-reading extension device 50 of the first embodiment in relation with the extension bay of a notebook personal computer. Fig.4 is an exploded view of the fingerprint-reading extension device 50. Fig.5 is a plan view of the fingerprint-reading extension device with a cover thereof removed.

As shown in Fig.3 through Fig.5, the fingerprint-reading extension device 50 includes a housing 52, a tray 53 provided movably in the direction X1-X2 inside the housing 52, a fingerprint-reading unit 54 exemplifying an identification-information-acquisition unit, and a cover 55 covering the tray 53 and fixed to the housing 52. In Fig.3, fingerprints are used as an example of biological information serving as an example of identification information.

The housing 52 is a box shape, and has a connector 51 attached to the back side thereof. Further, the housing 52 includes an operation button mechanism 52-1 and a damper 52-2.

The tray 53 is movable in the direction X1-X2 as it is guided through guide rails 52-3 and 52-4. The tray 53 sticks out from the housing 52 toward the direction X2 as it is slid out, and can maintain either one of the two sliding positions. The tray 53 has a fingerprint-detection-unit container unit 53-1 that is a box shape having a size suitable for accommodating the fingerprint-reading unit 54. Inside the fingerprint-detection-unit container unit 53-1 is provided a connector 53-3, which is implemented on a print circuit board 53-2. The print circuit board 53-2 is connected to the

connector 51 via a flexible cable 53-4 having a  
sufficient extension. The tray 53 has a rack 53-5  
formed on a side facing the direction Y2 and  
extending in the direction X1-X2. Further, the tray  
5 53 has a first notch 53-6, a second notch 53-7, and  
a third notch 53-8 formed at different positions  
along the direction X1-X2 on the side facing the  
direction Y2.

The rack 53-5 engages gears 52-2a of the  
10 damper 52-2.

The operation button mechanism 52-1  
exemplifying an operation unit selectively engages  
one of the first notch 53-6, the second notch 53-7,  
and the third notch 53-8. When the button is  
15 pressed while the mechanism is engaged in a notch,  
the operation button mechanism 52-1 disengages from  
the notch.

The operation button mechanism 52-1 and  
the three notches 53-6 through 53-8 are spatially  
20 arranged as follows. When the operation button  
mechanism 52-1 engages the first notch 53-6, the  
entirety of the tray 53 is encased in the housing 52  
as shown in Fig.5. When the operation button  
mechanism 52-1 engages the second notch 53-7, a  
25 portion of the tray 53 sticks out from the housing  
52 so as to barely show a full view of an opening  
54-2a of the fingerprint-reading unit 54, as shown  
in Fig.10. When the operation button mechanism 52-1  
engages the third notch 53-8, the fingerprint-  
30 reading unit 54 is fully exposed to the outside of  
the housing 52.

As shown in Fig.6A as well as in Figs.7A  
through 7C, The fingerprint-reading unit 54  
exemplifying an identification-information-  
35 acquisition unit includes a capacitance-based  
fingerprint sensor 54-5 (which is an example of an  
identification-information-acquisition means) stored

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in a box 54-4, which is comprised of an upper half 54-2 and a lower half 54-3. The capacitance-based fingerprint sensor 54-5 is positioned in the upper half 54-2. In the lower half 54-3, a left-hand-side connector 54-6, a right-hand-side connector 54-7, and a cable connector 54-8 are implemented on a print circuit board 54-9. The capacitance-based fingerprint sensor 54-5 faces the opening 54-2a formed in the upper half 54-2 where the opening 54-2a is usually closed by a shutter 54-1. When the shutter 54-1 is slid toward the direction Y1, the capacitance-based fingerprint sensor 54-5 is exposed through the opening 54-2a. The shutter 54-1 is provided on an inner wall of the upper half 54-2, and is shut automatically by a spring 54-1a.

The capacitance-based fingerprint sensor 54-5 may be FPS100 Solid-State Fingerprint Sensor manufactured by Veridicom.

As shown in Fig.7C, the connectors 54-6, 54-7, and 54-8 are positioned along a line 54-9 extending in the direction Y1-Y2 passing through a center O of the fingerprint-reading unit 54. The connectors 54-6 and 54-7 are identical, and are situated at symmetrical positions relative to the center O. The connectors 54-6 and 54-7 are exposed through respective openings 54-3b and 54-3c formed in a bottom plate 54-3a. The connector 54-8 is positioned on a backside of the fingerprint-reading unit 54, and is exposed through an opening 54-3e formed in a side panel 54-3d of the lower half 54-3.

The fingerprint-reading extension device 50 is such that the fingerprint-reading unit 54 is contained in the fingerprint-detection-unit container unit 53-1 with the left-hand-side connector 54-6 thereof connected to the connector 53-3, and such that the tray 53 is slid toward the direction X1 as far as it can go so as to have the

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fingerprint-reading unit 54 fully encased in the fingerprint-reading extension device 50. The tray 53 is urged toward the direction X2 by a spring coil 54-11 when the operation button mechanism 52-1  
5 engages the first notch 53-6 to restrict movement in the direction X2. The fingerprint-reading unit 54 is removable from the fingerprint-detection-unit container unit 53-1.

In the following, relation between the  
10 fingerprint-reading unit 54 and the notebook personal computer 20 will be described.

As shown in Fig.8, the fingerprint-reading unit 54 includes a fingerprint input unit 60. The notebook personal computer 20 includes a  
15 fingerprint-feature-extraction unit 62, a fingerprint-registration unit 63, and a fingerprint matching unit 64. The fingerprint-feature-extraction unit 62 extracts fingerprint features from image data supplied from the fingerprint input  
20 unit 60. The fingerprint-registration unit 63 stores therein registered fingerprint data of an index finger of a user's left hand. The fingerprint matching unit 64 matches fingerprint data supplied from the fingerprint-feature-extraction unit 62 with  
25 the fingerprint data of the fingerprint-registration unit 63. In this configuration, the fingerprint-reading unit 54 reads fingerprints, which is all that it does. Then, the notebook personal computer 20 attends to data processing to check  
30 identification.

In what follows, usage of the fingerprint-reading extension device 50 will be described.

#### 1) Carrying of Notebook Personal Computer To Outside Office

35 When a user takes the notebook personal computer 20 with him/her to outside the office, the fingerprint-reading extension device 50 is inserted

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into the extension bay 24 of the computer body 21, and the connector 51 is connected to the connector provided on the back wall of the extension bay 24.

In this arrangement, the fingerprint-reading extension device 50 is encased in the computer body 21, so that the fingerprint-reading unit 54 is now an integral part of the notebook personal computer 20. All that needs to be done is to carry the notebook personal computer 20, with no need to carry a separate fingerprint-reading unit. This provides better portability compared with the configuration of Fig.1 in which the card-type fingerprint identification device 1 has to be carried separately from the notebook personal computer 10.

When the fingerprint-reading extension device 50 is mounted in the extension bay 24 of the computer body 21, the fingerprint-reading unit 54 is electrically connected to the CPU 61 inside the computer body 21 via the connector 53-3, the flexible cable 53-4, and the connector 51.

## 2) Use of Notebook Personal Computer Outside Office

When the notebook personal computer 20 is to be operated outside office, the operation button mechanism 52-1 needs to be pressed first.

In response, the first notch 53-6 is disengaged, so that the tray 53 moves toward the direction X2 by force of the spring coil 54-11, resulting in the tray 53 sticking out from the side of the computer body 21. The tray 53 stops when the operation button mechanism 52-1 engages the second notch 53-7. As a result, as shown in Fig.9 and Fig.10, the opening 54-2a of the fingerprint-reading unit 54 is exposed outside the extension bay 24, allowing the shutter 54-1 to be open manually.

5                   The capacitance-based fingerprint sensor  
54-5 reads the fingerprint of the index finger. The  
fingerprint data is then sent to the computer body  
21 via the connector 53-3, the flexible cable 53-4,  
and the connector 51. The computer body 21 extracts  
10 features of the fingerprint, and matches the  
extracted fingerprint features with registered  
fingerprint data so as to check identification.

After the notebook personal computer 20 is activated, the tray 53 is slid in the direction X1 to be stored inside the notebook personal computer 20. In this stored position, the fingerprint-reading unit 54 does not encumber handling of the notebook personal computer 20.

35                    3) Use of Notebook Personal Computer on  
Office Desk

When the notebook personal computer 20 is

used on the user's office desk, it would be cumbersome to operate the fingerprint-reading unit 54 to have it stick out each time the user starts using the notebook personal computer 20. As shown  
5 in Fig.12, therefore, the fingerprint-reading unit 54 is kept in a disengaged position.

While the fingerprint-reading extension device 50 is encased in the extension bay 24 of the notebook personal computer 20, or while the  
10 fingerprint-reading extension device 50 is placed outside the extension bay 24 of the notebook personal computer 20, a push of the operation button mechanism 52-1 results in a condition as shown in Fig.9 or fig.10. If the operation button mechanism  
15 52-1 is pressed once again, the engagement of the second notch 53-7 is lost, so that the tray 53 is slid further out in the direction X2 by the spring coil 54-11, and stops when the operation button mechanism 52-1 engages the third notch 53-8. This  
20 condition is shown in Fig.11. As shown in Fig.11, the entirety of the fingerprint-reading unit 54 is exposed outside the extension bay 24, so that the fingerprint-reading unit 54 can be taken out of the fingerprint-detection-unit container unit 53-1.

25 The fingerprint-reading unit 54 is taken out of the fingerprint-detection-unit container unit 53-1, and the tray 53 is slid in the direction X1 to be stored inside the housing 52. It should be noted that, by lifting up the fingerprint-reading unit 54  
30 in the direction Z1, the connector 54-6 is disconnected from the connector 53-3, thereby allowing the fingerprint-reading unit 54 to be removed from the fingerprint-detection-unit container unit 53-1.

35 Then, as shown in Fig.12, a cord 72 having connectors 70 and 71 at respective ends thereof is used. The connector 70 is of a USB (universal

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serial bus) type, which is a general-purpose interface. The connector 71 is connected to the connector 54-8 of the fingerprint-reading unit 54, and the USB connector 70 is connected to a connector socket provided at the back panel of the computer body 21. By the use of the cord 72, the user can operate the fingerprint-reading unit 54 together with the computer.

In the following, the reason why the right-hand-side connector 54-7 is provided on the lower surface of the fingerprint-reading unit 54 in addition to the connector 54-6 will be described.

When the extension bay 24 is provided on the right-hand side of the computer body 21 (i.e., the side towards the direction X1) to receive a fingerprint-reading unit therein, the fingerprint-reading unit needs to stick out from the right-hand-side panel of the computer body 21. In order for the fingerprint-reading unit 54 to be used in this configuration, the fingerprint-reading unit 54 needs to have the right-hand-side connector 54-7. It should be noted that algorithms for identifying fingerprints are well known in the art, and one that is disclosed in Japanese Patent Laid-open Application No.10-312459 may be employed in the present invention.

Heretofore, a description of the first embodiment has been given. Although identification checks in the first embodiment are made by employing fingerprints as an example of biological information, the present invention is not limited to use of fingerprints. Rather than relying on fingerprints, other biological information such as voice (voice patterns), retinal patterns, handwritings, or facial features may be detected for identification purposes. When voice is used as identification information, the fingerprint sensor 54-5 of the unit 54 of the



registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the retinal-pattern-feature-extraction unit 62, the retinal-pattern-registration unit 63, and the retinal-pattern matching unit 64. Further, the first embodiment of this variation may be configured such that the detection unit 54 (an image-detection unit such as a CCD camera) is detachable (Fig.4), such that the right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6), such that the detection unit 54 (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54 (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.12), thereby adopting various configurations of the first embodiment described above.

When the handwriting is used as identification information, the fingerprint sensor 54-5 of the unit 54 of the extension device 50 as shown in Fig.3 through Fig.11 may be replaced by a touch-inputting means or a handwriting-inputting means (which is comprised of a touch panel such as a digitizer or an input-tablet plate alone or a combination of these and a pen-inputting means or stylus). In this case, the shutter 54-1 may be provided as necessary. The fingerprint input unit 60 shown in Fig.8 is then replaced by a touch-inputting unit or a handwriting-inputting unit, which transmits handwriting-pattern data to the notebook personal computer 20. In Fig.8, the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the handwriting-pattern-feature-

When facial features are used as identification information, the fingerprint sensor 54-5 of the unit 54 of the extension device 50 as shown in Fig.3 through Fig.11 may be replaced by an image-detection means (such as a CCD camera). In this case, the shutter 54-1 may be provided if necessary. The fingerprint input unit 60 shown in Fig.8 is then replaced by an image-detection unit, which transmits detected-image data to the notebook personal computer 20. In Fig.8, the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the facial-feature-extraction unit 62, the facial-pattern-registration unit 63, and the facial-pattern matching unit 64. Further, the first embodiment of this variation may be configured such that the detection unit 54 (an image-detection unit such as a CCD camera) is detachable (Fig.4), such that the

When facial features are used as identification information, the fingerprint sensor 54-5 of the unit 54 of the extension device 50 as shown in Fig.3 through Fig.11 may be replaced by an image-detection means (such as a CCD camera). In this case, the shutter 54-1 may be provided if necessary. The fingerprint input unit 60 shown in Fig.8 is then replaced by an image-detection unit, which transmits detected-image data to the notebook personal computer 20. In Fig.8, the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the facial-feature-extraction unit 62, the facial-pattern-registration unit 63, and the facial-pattern matching unit 64. Further, the first embodiment of this variation may be configured such that the detection unit 54 (an image-detection unit such as a CCD camera) is detachable (Fig.4), such that the



right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6), such that the detection unit 54 (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54 (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.12), thereby adopting various configurations of the first embodiment described above.

Moreover, the present invention is not limited to use of biological information for the purpose of identification check. As will be shown in Fig.23, Fig.25, and Fig.27, which will be described later, identification information may be obtained from ID cards such as IC cards or magnetic cards, or may be obtained from a user when the user uses buttons to enter a password or an ID number. In this case, the detection unit 54 shown in Fig.3 through Fig.5 may be replaced by an IC-card reader, a magnetic-card reader, or buttons such as on a keypad. Alternatively, such a reader or buttons may be provided on the detachable detection unit 54. By the same token, the first embodiment of this variation may be configured such that the right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6), such that the detection unit 54 (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54 (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) is connectable by a cable (Fig.12), thereby adopting various configurations of the first

embodiment described above.

[Second Embodiment]

Fig.13 is an illustrative drawing showing  
5 an extension device having an identification-  
information-acquisition function or providing a  
security function (for example, a fingerprint-  
reading extension device 50A) according to a second  
embodiment of the present invention. The  
10 fingerprint-reading extension device 50A has the  
same configuration as the fingerprint-reading  
extension device 50 shown in Fig.4, and is provided  
with a fingerprint-reading unit 54A exemplifying an  
identification-information-acquisition unit in place  
15 of the fingerprint-reading unit 54. In Fig.13,  
fingerprints are used as an example of biological  
information serving as an example of identification  
information.

A comparison of Fig.14 with Fig.8 reveals  
20 that the fingerprint-reading unit 54A is provided  
with the fingerprint-feature-extraction unit 62 in  
addition to the fingerprint input unit 60, and the  
notebook personal computer 20A includes the control  
unit, the fingerprint-registration unit 63, and the  
25 fingerprint matching unit 64. The fingerprint-  
reading unit 54A reads fingerprints, and extracts  
fingerprint features from the read fingerprint data.  
The fingerprint-reading unit 54A supplies the  
fingerprint feature data to the notebook personal  
30 computer 20A, and the notebook personal computer 20A  
carries out a user identification process.

[Third Embodiment]

Fig.15 is an illustrative drawing showing  
35 an extension device having an identification-  
information-acquisition function or providing a  
security function (for example, a fingerprint-

reading extension device 50B) according to a third embodiment of the present invention. The fingerprint-reading extension device 50B has the same configuration as the fingerprint-reading extension device 50 shown in Fig.4, and is provided with a fingerprint-reading unit 54B in place of the fingerprint-reading unit 54. In Fig.15, fingerprints are used as an example of biological information serving as an example of identification information.

A comparison of Fig.16 with Fig.8 reveals that the fingerprint-reading unit 54B is provided with the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 in addition to the fingerprint input unit 60. In this configuration, therefore, the fingerprint-reading unit 54B attends to all the processing from detecting fingerprints, extracting fingerprint features from the detected fingerprints, matching the extracted features with registered fingerprint data, to checking user identification. The fingerprint-reading unit 54A then supplies the identification-check results to the control unit 61 of the notebook personal computer 20B.

Heretofore, a description of the second and third embodiments has been given. Although identification checks in the second and third embodiments are made by employing fingerprints as an example of biological information, the present invention is not limited to use of fingerprints. Rather than relying on fingerprints, other biological information such as voice (voice patterns), retinal patterns, handwritings, or facial features may be detected for identification purposes. When voice is used as identification information, the fingerprint sensor 54A-5 or 54B-5 of the unit

54A or 54B of the extension device 50A or 50B as shown in Fig.13 or Fig.15 may be replaced by a voice-input means (such as a microphone). In this case, the shutter 54A-1 or 54B-1 is unnecessary.

5 The fingerprint input unit 60 shown in Fig.14 or 16 is then replaced by a voice-inputting unit, which transmits voice data to the notebook personal computer 20A or 20B. In Fig.14 or 16, the fingerprint-feature-extraction unit 62, the  
10 fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the voice-pattern-feature-extraction unit 62, the voice-pattern-registration unit 63, and the voice-pattern matching unit 64. Further, the  
15 second and third embodiments of this variation may be configured such that the detection unit 54A or 54B (microphone) is detachable (Fig.4, 13, or 15), such that the right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6),  
20 such that the detection unit 54A or 54B (microphone) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54A or 54B (microphone) is  
25 connectable by a cable (Fig.12), thereby adopting various configurations of the first embodiment previously described.

When the retinal pattern is used as identification information, the fingerprint sensor  
30 54A-5 or 54B-5 of the unit 54A or 54B of the extension device 50A or 50B as shown in Fig.13 or Fig.15 may be replaced by a retinal-pattern-input means (such as a CCD camera serving as an image-detection unit). In this case, the shutter 54A-1 or  
35 54B-1 may be provided if necessary. The fingerprint input unit 60 shown in Fig.14 or 16 is then replaced by a retinal-pattern-inputting unit, which transmits

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retinal-pattern data to the notebook personal  
computer 20A or 20B. In Fig.14 or Fig.16, the  
fingerprint-feature-extraction unit 62, the  
fingerprint-registration unit 63, and the  
5 fingerprint matching unit 64 are respectively  
replaced by the retinal-pattern-feature-extraction  
unit 62, the retinal-pattern-registration unit 63,  
and the retinal-pattern matching unit 64. Further,  
the second and third embodiments of this variation  
10 may be configured such that the detection unit 54A  
or 54B (an image-detection unit such as a CCD  
camera) is detachable (Fig.4, 13, or 15), such that  
the right-hand-side connector 54-7 and the left-  
hand-side connector 54-6 are provided (Fig.6), such  
15 that the detection unit 54A or 54B (an image-  
detection unit such as a CCD camera) can partially  
stick out from the information processing device  
(Fig.9) or entirely stick out from the information  
processing device (Fig.11), or such that the  
20 detection unit 54A or 54B (an image-detection unit  
such as a CCD camera) is connectable by a cable  
(Fig.12), thereby adopting various configurations of  
the first embodiment previously described.

When the handwriting is used as  
25 identification information, the fingerprint sensor  
54A-5 or 54B-5 of the unit 54A or 54B of the  
extension device 50A or 50B as shown in Fig.13 or  
Fig.15 may be replaced by a touch-inputting means or  
a handwriting-inputting means (which is comprised of  
30 a touch panel such as a digitizer or an input-tablet  
plate alone or a combination of these and a pen-  
inputting means or stylus). In this case, the  
shutter 54A-1 or 54B-1 may be provided as necessary.  
The fingerprint input unit 60 shown in Fig.14 or  
35 Fig.16 is then replaced by a touch-inputting unit or  
a handwriting-inputting unit, which transmits  
handwriting-pattern data to the notebook personal

computer 20A or 20B. In Fig.14 or Fig.16, the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively  
5 replaced by the handwriting-pattern-feature-extraction unit 62, the handwriting-pattern-registration unit 63, and the handwriting-pattern matching unit 64. Further, the second and third embodiments of this variation may be configured such  
10 that the detection unit 54A or 54B (a touch-inputting means or a handwriting-inputting means) is detachable (Fig.4), such that the right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6), such that the detection unit  
15 54A or 54B (a touch-inputting means or a handwriting-inputting means) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54A  
20 or 54B (a touch-inputting means or a handwriting-inputting means) is connectable by a cable (Fig.12), thereby adopting various configurations of the first embodiment previously described.

When facial features are used as  
25 identification information, the fingerprint sensor 54A-5 or 54B-5 of the unit 54A or 54B of the extension device 50A or 50B as shown in Fig.13 or Fig.15 may be replaced by an image-detection means (such as a CCD camera). In this case, the shutter  
30 54A-1 or 54B-1 may be provided if necessary. The fingerprint input unit 60 shown in Fig.14 or Fig.16 is then replaced by an image-detection unit, which transmits detected-image data to the notebook personal computer 20A or 20B. In Fig.14 or Fig.16,  
35 the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively

replaced by the facial-feature-extraction unit 62, the facial-pattern-registration unit 63, and the facial-pattern matching unit 64. Further, the second and third embodiments of this variation may be configured such that the detection unit 54A or 54B (an image-detection unit such as a CCD camera) is detachable (Fig.4), such that the right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6), such that the detection unit 54A or 54B (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54A or 54B (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.12), thereby adopting various configurations of the first embodiment previously described.

Moreover, the present invention is not limited to use of biological information for the purpose of identification check. As will be shown in Fig.23, Fig.25, and Fig.27, which will be described later, identification information may be obtained from ID cards such as IC cards or magnetic cards, or may be obtained from a user when the user uses buttons to enter a password or an ID number. In this case, the detection unit 54A or 54B shown in Fig.13 or Fig.15 may be replaced by an IC-card reader, a magnetic-card reader, or buttons such as on a keypad. Alternatively, such a reader or buttons may be provided on the detachable detection unit 54A or 54B. By the same token, the second and third embodiments of this variation may be configured such that the right-hand-side connector 54-7 and the left-hand-side connector 54-6 are provided (Fig.6), such that the detection unit 54A or 54B (an IC-card reader, a magnetic-card reader,

or buttons such as on a keypad) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54A or 54B (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) is connectable by a cable (Fig.12), thereby adopting various configurations of the first embodiment previously described.

[Fourth Embodiment]

Fig.17 and Fig.18 are illustrative drawings showing an extension device having an identification-information-acquisition function or providing a security function (for example, a fingerprint-reading extension device 50C) according to a fourth embodiment of the present invention. The fingerprint-reading extension device 50C has the same configuration as the fingerprint-reading extension device 50 shown in Fig.4, and is provided with a fingerprint-reading unit 54C exemplifying an identification-information-acquisition unit in place of the fingerprint-reading unit 54. In Fig.17 and Fig.18, elements equivalent to those of Fig.4 are referred to by the same reference numbers followed by a letter "C", and a description thereof will be omitted. In Fig.17 and Fig.18, fingerprints are used as an example of biological information serving as an example of identification information.

As shown in Figs.19A and 19B, the fingerprint-reading unit 54C has a cable 54C-9 extending from a side panel and having a USB connector 54C-10 attached to an end thereof. The fingerprint-reading unit 54C is not provided with the connectors 54-6, 54-7, and 54-8 as shown in Fig.6B.

A cover 55C is easy to open or close. The



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fingerprint-reading unit 54C is contained in a fingerprint-detection-unit container unit 53C-1 of a tray 53C. The cable 54C-9 is folded to be stored in the tray 53C. A print board 54C-13 is provided at  
5 the back of a housing 52C, and has a connector 54C-12 fixedly mounted thereon. The connector 54C-12 is electrically connected to a connector 51C via the print board 54C-13. The USB connector 54C-10 at the end of the cable 54C-9 is connected to the connector  
10 54C-12.

The fingerprint-reading extension device 50C is used and operated in much the same manner as the fingerprint-reading extension device 50 of Fig.3.

When the notebook personal computer 20C is  
15 to be carried to outside the office, the fingerprint-reading extension device 50C is inserted into the extension bay 24C of the computer body 21C. The fingerprint-reading extension device 50C is carried together with the computer body 21C.

20 When the notebook personal computer 20C is operated outside the office, the operation button mechanism 52-1 is pressed once to have the fingerprint-reading unit 54C stick out from the extension bay 24. While the fingerprint-reading  
25 unit 54C is in this position, the user has his/her left-hand index finger read by the capacitance-based fingerprint sensor 54C-5. Further, as shown in Fig.11 of the first embodiment, the fingerprint-reading unit may be so configured as to be able to  
30 stick out entirely from the notebook personal computer.

When the notebook personal computer 20C is operated on the office desk, the fingerprint-reading extension device 50C is taken out of the extension  
35 bay 24C of the notebook personal computer 20C. Then, the cover 55C is opened, and the USB connector 54C-10 is pulled off from the connector 54C-12 to detach

5 fingerprint-reading unit 54C is then ready for use.

10                   The fingerprint-reading unit 54C and the  
notebook personal computer 20 may have a  
configuration as shown in Fig.14 or a configuration  
as shown in Fig.16. In the case of the  
configuration shown in Fig.16, the fingerprint-  
15   reading unit 54C functions as a fingerprint  
identification unit.

When voice is used as identification information, the fingerprint sensor 54C-5 of the unit 54C of the extension device 50C as shown in Fig.17 through Fig.21 may be replaced by a voice-input means (such as a microphone). In this case, the shutter 54C-1 is unnecessary. The voice-input means and the notebook personal computer 20 may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by a voice-input unit, with the

fingerprint-feature-extraction unit 62, the  
fingerprint-registration unit 63, and the  
fingerprint matching unit 64 respectively replaced  
by the voice-pattern-feature-extraction unit 62, the  
5 voice-pattern-registration unit 63, and the voice-  
pattern matching unit 64. Further, the fourth  
embodiment of this variation may be configured such  
that the detection unit 54C (microphone) is  
detachable (Fig.19), such that the detection unit 54  
10 (microphone) can partially stick out from the  
information processing device (Fig.20) or entirely  
stick out from the information processing device, or  
such that the detection unit 54C (microphone) is  
connectable by a cable (Fig.21), thereby adopting  
15 various configurations of the fourth embodiment  
described above.

When the retinal pattern is used as  
identification information, the fingerprint sensor  
54C-5 of the unit 54C of the extension device 50C as  
20 shown in Fig.17 through Fig.21 may be replaced by a  
retinal-pattern-input means (such as a CCD camera  
serving as an image-detection unit). In this case,  
the shutter 54C-1 may be provided if necessary. The  
retinal-pattern-input means and the notebook  
25 personal computer 20 may be configured to relate to  
each other as shown in Fig.8, Fig.14, or Fig.16. In  
this case, the fingerprint input unit 60 shown in  
Fig.8, Fig.14, and Fig.16 is replaced by a retinal-  
pattern-input unit, with the fingerprint-feature-  
30 extraction unit 62, the fingerprint-registration  
unit 63, and the fingerprint matching unit 64  
respectively replaced by the retinal-pattern-  
feature-extraction unit 62, the retinal-pattern-  
registration unit 63, and the retinal-pattern  
35 matching unit 64. Further, the fourth embodiment of  
this variation may be configured such that the  
detection unit 54C (an image-detection unit such as

a CCD camera) is detachable (Fig.19), such that the detection unit 54C (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54C (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment described above.

When the handwriting is used as identification information, the fingerprint sensor 54C-5 of the unit 54C of the extension device 50C as shown in Fig.17 through Fig.21 may be replaced by a touch-inputting means or a handwriting-inputting means (which is comprised of a touch panel such as a digitizer or an input-tablet plate alone or a combination of these and a pen-inputting means or stylus). In this case, the shutter 54C-1 may be provided as necessary. The touch-inputting means or the handwriting-inputting means and the notebook personal computer 20 may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by a handwriting-pattern-input unit, with the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 respectively replaced by the handwriting-pattern-feature-extraction unit 62, the handwriting-pattern-registration unit 63, and the handwriting-pattern matching unit 64. Further, the fourth embodiment of this variation may be configured such that the detection unit 54C (a touch-inputting means or a handwriting-inputting means) is detachable (Fig.19), such that the detection unit 54C (a touch-inputting means or a handwriting-inputting means) can partially stick out

from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54 (a touch-inputting means or a handwriting-inputting means) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment described above.

When facial features are used as identification information, the fingerprint sensor 54C-5 of the unit 54C of the extension device 50C as shown in Fig.17 through Fig.21 may be replaced by an image-detection means (such as a CCD camera). In this case, the shutter 54C-1 may be provided if necessary.

The image-detection means and the notebook personal computer 20 may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by an image-detection unit, with the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 respectively replaced by the facial-feature-extraction unit 62, the facial-pattern-registration unit 63, and the facial-pattern matching unit 64. Further, the fourth embodiment of this variation may be configured such that the detection unit 54C (an image-detection unit such as a CCD camera) is detachable (Fig.19), such that the detection unit 54C (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54C (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment described above.

Moreover, the present invention is not limited to use of biological information for the purpose of identification check. As will be shown in Fig.23, Fig.25, and Fig.27, which will be described later, identification information may be obtained from ID cards such as IC cards or magnetic cards, or may be obtained from a user when the user uses buttons to enter a password or an ID number. In this case, the detection unit 54C shown in Fig.17 through Fig.21 may be replaced by an IC-card reader, a magnetic-card reader, or buttons such as on a keypad. Alternatively, such a reader or buttons may be provided on the detachable detection unit 54C. By the same token, the fourth embodiment of this variation may be configured such that the detection unit 54C (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54C (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment described above.

[Fifth Embodiment]

Fig.22 is an illustrative drawing showing an extension device having an identification-information-acquisition function or providing a security function (for example, a fingerprint-reading extension device 80) according to a fifth embodiment of the present invention. The fingerprint-reading extension device 80 has an outer surface shape that fits into an extension bay 24D of a notebook personal computer 20D. The fingerprint-reading extension device 80 has a capacitance-based

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fingerprint sensor 83 provided on a side panel 82 thereof. The capacitance-based fingerprint sensor 83, which exemplifies an identification-information-acquisition means, is covered with a shutter 84 most of the time. The side panel 82 is a surface that becomes a left-hand-side panel of the computer body 21D when the fingerprint-reading extension device 80 is inserted into the extension bay 24D. In Fig.22, fingerprints are used as an example of biological information serving as an example of identification information.

The fingerprint-reading extension device 80 is operated while it is mounted in the extension bay 24D, exemplifying a container unit, of the notebook personal computer 20D. This provides good portability. The fingerprint-reading extension device 80 and the notebook personal computer 20D may have a configuration equivalent to that shown in Fig.8.

When the notebook personal computer 20D is operated, the user opens the shutter 84 by sliding it in the direction Y1 with his/her left-hand index finger, and places the index finger on the capacitance-based fingerprint sensor 83.

The capacitance-based fingerprint sensor 84 reads the fingerprint of the index finger. The fingerprint data is then sent to the computer body 21 via a connector 81. The computer body 21 extracts features of the fingerprint, and matches the extracted fingerprint features with registered fingerprint data so as to check identification of the user. If the user is authorized, the notebook personal computer 20 can be activated. If the user is not authorized, the user cannot activate the notebook personal computer 20 even if he/she tries. This ensures security.

The fingerprint-reading extension device

5 [Sixth Embodiment]

The IC-card-reader extension device 90 is operated while it is set in an extension bay 24E, exemplifying a container unit, of a notebook 20 personal computer 20E. The IC-card-reader extension device 90 thus provides desirable portability.

When the notebook personal computer 20E is to be operated, the IC card 95 is inserted into the opening 94.

The IC-card-reader head 92 reads data of the IC card 95, and the data is transferred to the



computer body 21E. The notebook personal computer 20E matches the data of the card with registered data so as to check identification of the user. If the user is authorized, the notebook personal  
5 computer 20E can be activated. If the user is not authorized, the user cannot activate the notebook personal computer 20E even if he/she tries to do so. This ensures security.

10 [Seventh Embodiment]

Fig.25 is an illustrative drawing showing a magnetic-card-reader extension device 100 according to a seventh embodiment of the present invention. The magnetic-card-reader extension  
15 device 100 reads a magnetic card that serves as an ID card. The magnetic-card-reader extension device 100 includes a magnetic-card-reader head 102 exemplifying an identification-information-acquisition means, and has an opening 104 provided  
20 in a side panel 103 for receiving a magnetic card. A magnetic card 105 records therein information about the user. In Fig.25, a magnetic card is used as an example of identification information.

The magnetic-card-reader extension device  
25 100 is operated while it is set in an extension bay 24F, exemplifying a container unit, of a notebook personal computer 20F. The magnetic-card-reader extension device 100 thus provides desirable portability.

30 The magnetic-card-reader extension device 100 and the notebook personal computer 20F have a configuration as shown in Fig.26. The magnetic-card-reader extension device 100 includes a magnetic-card-data-input unit 106. The notebook  
35 personal computer 20F includes a control unit 107, a data-registration unit 108 for storing registered data of the user, and a data matching unit 109 for

matching the data of the magnetic-card-data-input unit 106 with the data of the data-registration unit 108.

When the notebook personal computer 20F is to be operated, the magnetic card 105 is inserted into the opening 104, and is slid through the opening 104 in the direction Y2.

The magnetic-card-reader head 102 reads data of the magnetic card 105, and the data is transferred to the computer body 21F. The notebook personal computer 20F matches the data of the card with registered data so as to check identification of the user. If the user is authorized, the notebook personal computer 20F can be activated. If the user is not authorized, the user cannot activate the notebook personal computer 20F even if he/she tries to do so. This ensures security.

[Eighth Embodiment]

Fig.27 is an illustrative drawing showing a PIN-input extension device 110 exemplifying an identification-information-acquisition means according to an eighth embodiment of the present invention. The PIN-input extension device 110 includes a button unit 113 comprised of a plurality of buttons provided on a side panel 112 facing the direction X2. The plurality of buttons are arranged in the direction Y1-Y2.

The PIN-input extension device 110 is operated while it is set in an extension bay 24G, exemplifying a container unit, of a notebook personal computer 20G. The PIN-input extension device 110 thus provides desirable portability. In Fig.27, a password, a PIN code, an ID code, etc., may be used as an example of identification information.

The PIN-input extension device 110 and the

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extension bay, one of the extension devices 50, 80, 90, 100, and 110 may be inserted into such an extension bay.

5 The above embodiments have been described  
with reference to a case in which a notebook-type  
personal computer having an extension bay is used.  
As pointed out in the above passage, however, a bay  
may be provided in a docking station or an extension  
unit connected to a notebook personal computer, and  
10 the device of the present invention may be inserted  
into such a bay. The present invention is not  
limited to any particular one of these  
configurations. The docking station is disclosed in  
Japanese Patent Laid-open Application No. 10-133778  
15 and Japanese Patent Laid-open Application No. 9-6475.  
Such a docking station is sometimes referred to as a  
function-extension device of a notebook personal  
computer. A typical docking station includes one or  
more peripheral devices that are not provided as a  
20 built-in device in the notebook personal computer.  
While the notebook personal computer is easy to  
carry around because of its portability, the  
notebook personal computer when used in office is  
connected to the docking station to provide  
25 functionality compatible to that of a desktop  
personal computer or to allow a user to use the  
notebook personal computer like using a desktop  
personal computer. In a typical configuration, the  
notebook personal computer is placed on the docking  
30 station, or is connected to the docking station by  
attaching the back panel of the computer to the  
docking station positioned behind the computer.

In other words, the terminology "extension  
bay" or "extension bay of an information-processing  
35 device" is used in this specification and claims not  
only to refer to an extension bay of a main body of  
an information processing device but also to refer

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to an extension bay of a function-extension unit, a docking station, or the like that is used together with the information processing device. It should be noted that there is a device called an extension-bay housing or a docking bay, which serves only as a bay and does not provide any additional functions. Such a device is used together with a personal computer. The terminology "extension bay" or "extension bay of an information-processing device" used in this specification and claims is also intended to cover such a device. When the docking station, the function-extension unit, the extension-bay housing, or the docking bay is combined together with an information-processing device, the single combined mass may be referred to as an information processing device. The terminology "information processing device" may be also used to refer to the docking station, the function-extension unit, the extension-bay housing, or the docking bay itself.

The docking station and the function-extension unit possess are equipped with a memory unit, and attend to information processing in one way or another. The extension-bay housing and the docking bay also attend to information processing when provided with a proper unit therein. Because of this, the terminology "information processing device" should be construed as including peripheral devices relating to information processing.

[Ninth Embodiment]

Fig.29 through Fig.31 are illustrative drawings showing the notebook personal computer 20 serving as an information-processing device having an identification-information-acquisition function or providing a security function according to a ninth embodiment of the present invention. In this embodiment, the information-processing device is

referred to as a notebook personal computer for the sake of convenience of explanation, but includes a portable terminal, a portable information-processing device, etc. Further, the terminology "computer"

5 means a device equipped with a processor of one type or another, a device equipped with an information processing function, a device for performing actions (storing data, communicating, etc.) relating to information processing of one type or another, etc.

10 In Figs.29 through Fig.30, the notebook  
personal computer 20 includes the computer body 21  
and the liquid-crystal-display unit 27 serving as a  
display unit that can be swung open to show a  
display screen. (In Fig.29 and Fig.30, the liquid-  
15 crystal-display unit 27 is only partially shown, but  
is the same in its entirety as that of Fig.2.) A  
direction X1-X2 corresponds to the width of the  
notebook personal computer 20. A direction Y1-Y2  
corresponds to the depth of the notebook personal  
20 computer 20. The computer body 21, which  
exemplifies a case or housing, has the keyboard  
portion 22 provided on an upper surface thereof and  
serving as an input unit, and has a CPU or a  
processor (not shown) contained therein.

25           An identification-information-acquisition  
device or a security device (e.g., fingerprint-  
detection device) according to the ninth embodiment  
is not detachably provided in the extension bay as  
in the first embodiment, but is fixedly provided in  
30 the information processing device. As shown in  
Fig.29 and Fig.30, this configuration includes a  
tray 53H exemplifying a sliding unit provided in the  
computer body 21 serving as a case or housing, and  
further includes a fingerprint-reading unit 54H  
35 provided on the tray 53H.

The information-processing device has an operation-button mechanism 52H-1 on the side panel

[illegible]

thereof. This mechanism exemplifies an operation means.

Fig.29 is an illustrative drawing showing the computer body 21 (case or housing) having the fingerprint-reading unit 54H exemplifying an identification-information-acquisition unit encased therein. Fig.30 is an illustrative drawing showing the fingerprint-reading unit 54H sticking out from the computer body 21 (case or housing). By operating the operation button 52H-1, the device is brought from the condition as shown in Fig.29 to the condition as shown in Fig.30. The sliding function of the tray 53H is provided by mechanisms of the damper 52-2 and the guide rails 52-3 and 52-4 as shown in Fig.5, Fig.10, and Fig.11. In order to return from the condition of Fig.30 to the condition of Fig.29, the user simply pushes the tray 53H in the direction X1.

The fingerprint-reading unit 54H has a capacitance-based fingerprint sensor 54H-5 provided thereon. The capacitance-based fingerprint sensor 54H-5 serving as an identification-information-acquisition unit is covered by a shutter 54H-1 when it is not used, and is exposed by sliding the shutter 54H-1 in the direction Y1.

The capacitance-based fingerprint sensor 54H-5 may be FPS100 Solid-State Fingerprint Sensor manufactured by Veridicom.

In the following, relation between the fingerprint-reading unit 54H and the notebook personal computer 20 will be explained.

As shown in Fig.31, the fingerprint-reading unit 54H includes the fingerprint input unit 60.

The notebook personal computer 20 includes the control unit 61, the fingerprint-feature-extraction unit 62 for extracting fingerprint





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Heretofore, the ninth embodiment of the

present invention has been described. As described above, the sliding of the tray 53H is achieved by employing the mechanisms of the first embodiment. Further, the first embodiment employed such a configuration that the fingerprint-reading unit 54 H could switch positions between partially sticking out from the computer body 21 (Fig.9) or entirely sticking out from the computer body 21 (Fig.11). This configuration may be employed in the ninth embodiment as well.

Moreover, the first embodiment adopted a configuration in which the fingerprint-reading unit 54H is detachable from the tray 53. The ninth embodiment may adopt this feature as well, and, also may be configured such that the fingerprint-reading unit 54H is fixed on the tray 53H. Further, the ninth embodiment may employ a configuration in which the fingerprint-reading unit 54 is connectable by a cable (Fig.12) as in the first embodiment. In such a case, the mode of use as shown in Fig.12 may be appropriate.

In the ninth embodiment described above, although identification checks are made by employing fingerprints as an example of biological information, the present invention is not limited to use of fingerprints. Rather than relying on fingerprints, other biological information such as voice (voice patterns), retinal patterns, handwritings, or facial features may be detected for identification purposes. When voice is used as identification information, the fingerprint sensor 54H-5 of the unit 54 as shown in Fig.29 and Fig.30 may be replaced by a voice-input means (such as a microphone). In this case, the shutter 54H-1 is unnecessary. The fingerprint input unit 60 shown in Fig.31 is then replaced by a voice-inputting unit, which transmits voice data to the notebook personal computer 20. In Fig.31, the

fingerprint-feature-extraction unit 62, the  
fingerprint-registration unit 63, and the  
fingerprint matching unit 64 are respectively  
replaced by the voice-pattern-feature-extraction  
5 unit 62, the voice-pattern-registration unit 63, and  
the voice-pattern matching unit 64. Further, this  
variation of the ninth embodiment may be configured  
such that the detection unit 54 (microphone) is  
detachable, such that the detection unit 54  
10 (microphone) can partially stick out from the  
information processing device or entirely stick out  
from the information processing device (Fig.11), or  
such that the detection unit 54 (microphone) is  
connectable by a cable (Fig.12), thereby adopting  
15 various configurations of the first through ninth  
embodiments described above.

When the retinal pattern is used as  
identification information, the fingerprint sensor  
54H-5 of the unit 54 as shown in Fig.29 and Fig.30  
20 may be replaced by a retinal-pattern-input means  
(such as a CCD camera serving as an image-detection  
unit). In this case, the shutter 54H-1 may be  
provided if necessary. The fingerprint input unit  
60 shown in Fig.31 is then replaced by a retinal-  
25 pattern-inputting unit, which transmits retinal-  
pattern data to the notebook personal computer 20.  
In Fig.31, the fingerprint-feature-extraction unit  
62, the fingerprint-registration unit 63, and the  
fingerpint matching unit 64 are respectively  
30 replaced by the retinal-pattern-feature-extraction  
unit 62, the retinal-pattern-registration unit 63,  
and the retinal-pattern matching unit 64. Further,  
this variation of the ninth embodiment may be  
configured such that the detection unit 54H (an  
35 image-detection unit such as a CCD camera) is  
detachable (Fig.4), such that the detection unit 54H  
(an image-detection unit such as a CCD camera) can

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partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54H (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.12), thereby adopting various configurations of the first through ninth embodiments described above.

When the handwriting is used as identification information, the fingerprint sensor 54H-5 of the unit 54H as shown in Fig.29 through Fig.31 may be replaced by a touch-inputting means or a handwriting-inputting means (which is comprised of a touch panel such as a digitizer or an input-tablet plate alone or a combination of these and a pen-inputting means or stylus). In this case, the shutter 54H-1 may be provided as necessary. The fingerprint input unit 60 shown in Fig.31 is then replaced by a touch-inputting unit or a handwriting-inputting unit, which transmits handwriting-pattern data to the notebook personal computer 20. In Fig.31, the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the handwriting-pattern-feature-extraction unit 62, the handwriting-pattern-registration unit 63, and the handwriting-pattern matching unit 64. Further, this variation of the ninth embodiment may be configured such that the detection unit 54H (a touch-inputting means or a handwriting-inputting means) is detachable (Fig.4), such that the detection unit 54H (a touch-inputting means or a handwriting-inputting means) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54H (a touch-inputting means or a handwriting-inputting means) is connectable by a

When facial features are used as identification information, the fingerprint sensor 54H-5 of the unit 54H as shown in Fig.29 through Fig.31 may be replaced by an image-detection means (such as a CCD camera). In this case, the shutter 54H-1 may be provided if necessary. The fingerprint input unit 60 shown in Fig.31 is then replaced by an image-detection unit, which transmits detected-image data to the notebook personal computer 20. In Fig.31, the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 are respectively replaced by the facial-feature-extraction unit 62, the facial-pattern-registration unit 63, and the facial-pattern matching unit 64. Further, this variation of the ninth embodiment may be configured such that the detection unit 54H (an image-detection unit such as a CCD camera) is detachable (Fig.4), such that the detection unit 54H (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.9) or entirely stick out from the information processing device (Fig.11), or such that the detection unit 54H (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.12), thereby adopting various configurations of the first through ninth embodiments described above.

Moreover, the present invention is not limited to use of biological information for the purpose of identification check. As was shown in Fig.23, Fig.25, and Fig.27 previously described, 35 identification information may be obtained from ID cards such as IC cards or magnetic cards, or may be obtained from a user when the user uses buttons to



20I includes a computer body 21I and a liquid-crystal-display unit 27I serving as a display unit that can be swung open to show a display screen. A direction X1-X2 corresponds to the width of the notebook personal computer 20I. A direction Y1-Y2 corresponds to the depth of the notebook personal computer 20I, and a direction Z1-Z2 corresponds to the height of the notebook personal computer 20I. The computer body 21I has a keyboard portion 22I provided on an upper surface thereof and serving as an input unit, and has a CPU 23I or a processor contained therein. At the bottom of the computer body 21I, an extension bay 24I is formed. In contrast with the notebook personal computer 20 shown in Fig.2, the notebook personal computer 20I of Fig.32 has the extension bay 24I formed on the right-hand side thereof (i.e., the side toward the direction X1), and an opening 26I of the extension bay 24I is provided on the front side of the computer body 21I facing the user. In this embodiment, namely, the opening 26I is provided on the side toward the direction Y2. It should be noted that the opening 24I would suffice if it is provided on the front side that faces the user, and may be provided on the left-hand side (i.e., the side toward the direction X2) rather than on the right-hand side.

In association with the notebook personal computer 20I, extension devices are provided, which include the extension floppy drive 30, the extension CD-ROM drive 40, the extension device (e.g., the fingerprint-reading extension device 50, 50A, 50B, 50C, or 50D) having an identification-information-acquisition means or providing a security function according to the first through fourth embodiments, the fingerprint-reading extension device 80 (or fingerprint-identification-check extension device)

according to the fifth embodiment, the IC-card-reader extension device 90 (or IC-card-identification-check extension device) according to the sixth embodiment, the magnetic-card-reader extension device 100 (or magnetic-card-identification-check extension device) according to the seventh embodiment, and the PIN-input extension device 110 (or PIN-identification-check extension device) according to the eighth embodiment. In Fig.32, an extension device can be inserted into the extension bay 24I from the opening 26I. A detailed configuration of the fingerprint-reading extension device 50I is shown in Fig.33. Further, details of the configuration of the fingerprint-reading unit 54I are shown in Fig.34. The fingerprint-reading unit 54I, which exemplifies an identification-information-acquisition unit, has a front-side connector 54I-9 provided on a bottom surface thereof between a left-hand-side connector 54I-6 and a right-hand-side connector 54I-7. As shown in Fig.34, an opening 54I-3d is also provided. The arrangement of these connectors makes it possible to mount the fingerprint-reading extension device 50 or 50I in the left-hand-side bay or the right-hand-side bay of the notebook personal computer 20 as shown in Fig.2, Fig.3, and Fig.4 as well as to mount the fingerprint-reading extension device 50 or 50I in the front bay that faces the user. When the fingerprint-reading extension device 50I is mounted in the front bay as shown in Fig.32, the shutter 54I-1 is preferably arranged such as to open in the same direction as the direction in which the tray 53I slides out and slides in. Namely, since the tray 53I extends from the keyboard 22I toward the user, it provides better manipulability for the user if the shutter 54I-1 opens in the direction Y1 rather than in the direction X1-X2 shown in Fig.32.



Accordingly, the fingerprint-reading unit 54I of Fig.34 is mounted on the tray 53I at a 90° angle relative to the fingerprint-reading unit 54 of the configuration of Fig.4. In this case, the connector 53I-3 shown in Fig.33 is connected to the front-side connector 54I-9 shown in Fig.34. When the fingerprint-reading unit 54I of Fig.34 is mounted on the tray 53 of Fig.4, the left-hand-side connector 54I-6 is connected to the connector 53-3.

Heretofore, the tenth embodiment of the present invention has been described. Although identification checks in the tenth embodiment are made by employing fingerprints as an example of biological information, the present invention is not limited to use of fingerprints. Rather than relying on fingerprints, other biological information such as voice (voice patterns), retinal patterns, handwritings, or facial features may be detected for identification purposes.

When voice is used as identification  
35 information, the fingerprint sensor 54I-5 of the  
unit 54I of the extension device 50I as shown in  
Fig.33 and Fig.34 may be replaced by a voice-input

means (such as a microphone). In this case, the shutter 54I-1 is unnecessary. The voice-input means and the notebook personal computer 20 may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by a voice-input unit, with the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 respectively replaced by the voice-pattern-feature-extraction unit 62, the voice-pattern-registration unit 63, and the voice-pattern matching unit 64. Further, the tenth embodiment of this variation may be configured such that the detection unit 54I (microphone) is detachable (Fig.19), such that the detection unit 54I (microphone) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54I (microphone) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment previously described.

When the retinal pattern is used as identification information, the fingerprint sensor 54I-5 of the unit 54I of the extension device 50I as shown in Fig.32 through Fig.34 may be replaced by a retinal-pattern-input means (such as a CCD camera serving as an image-detection unit). In this case, the shutter 54I-1 may be provided if necessary. The retinal-pattern-input means and the notebook personal computer 20 may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by a retinal-pattern-input unit, with the fingerprint-feature-extraction unit 62, the fingerprint-registration

unit 63, and the fingerprint matching unit 64 respectively replaced by the retinal-pattern-feature-extraction unit 62, the retinal-pattern-registration unit 63, and the retinal-pattern  
5 matching unit 64. Further, the tenth embodiment of this variation may be configured such that the detection unit 54I (an image-detection unit such as a CCD camera) is detachable (Fig.19), such that the  
10 detection unit 54I (an image-detection unit such as a CCD camera) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or  
15 such that the detection unit 54I (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment previously described.

When the handwriting is used as identification information, the fingerprint sensor 54I-5 of the unit 54I of the extension device 50I as  
20 shown in Fig.32 through Fig.34 may be replaced by a touch-inputting means or a handwriting-inputting means (which is comprised of a touch panel such as a digitizer or an input-tablet plate alone or a  
25 combination of these and a pen-inputting means or stylus). In this case, the shutter 54I-1 may be provided as necessary. The touch-inputting means or the handwriting-inputting means and the notebook  
30 personal computer 20 may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by a  
35 handwriting-pattern-input unit, with the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 respectively replaced by the handwriting-pattern-feature-extraction unit 62, the handwriting-pattern-registration unit 63,

and the handwriting-pattern matching unit 64.

Further, the tenth embodiment of this variation may be configured such that the detection unit 54I (a touch-inputting means or a handwriting-inputting means) is detachable (Fig.19), such that the detection unit 54I (a touch-inputting means or a handwriting-inputting means) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54I (a touch-inputting means or a handwriting-inputting means) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment previously described.

When facial features are used as identification information, the fingerprint sensor 54I-5 of the unit 54I of the extension device 5IC as shown in Fig.32 and Fig.33 may be replaced by an image-detection means (such as a CCD camera). In this case, the shutter 54I-1 may be provided if necessary.

The image-detection means and the notebook personal computer 20I may be configured to relate to each other as shown in Fig.8, Fig.14, or Fig.16. In this case, the fingerprint input unit 60 shown in Fig.8, Fig.14, and Fig.16 is replaced by an image-detection unit, with the fingerprint-feature-extraction unit 62, the fingerprint-registration unit 63, and the fingerprint matching unit 64 respectively replaced by the facial-feature-extraction unit 62, the facial-pattern-registration unit 63, and the facial-pattern matching unit 64. Further, the tenth embodiment of this variation may be configured such that the detection unit 54I (an image-detection unit such as a CCD camera) is detachable (Fig.19), such that the detection unit 54I (an image-detection unit such as a CCD camera)

can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54I (an image-detection unit such as a CCD camera) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment previously described.

Moreover, the present invention is not limited to use of biological information for the purpose of identification check. As was shown in Fig.23, Fig.25, and Fig.27 previously described, identification information may be obtained from ID cards such as IC cards or magnetic cards, or may be obtained from a user when the user uses buttons to enter a password, an ID number, a PIN code, etc. In this case, the detection unit 54I shown in Fig.32 may be replaced by an IC-card reader, a magnetic-card reader, or buttons such as on a keypad. Alternatively, such a reader or buttons may be provided on the detachable detection unit 54I. By the same token, the tenth embodiment of this variation may be configured such that the detection unit 54I (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) can partially stick out from the information processing device (Fig.20) or entirely stick out from the information processing device, or such that the detection unit 54I (an IC-card reader, a magnetic-card reader, or buttons such as on a keypad) is connectable by a cable (Fig.21), thereby adopting various configurations of the fourth embodiment previously described.

Further, the present invention is not limited to these embodiments, but various variations and modifications may be made without departing from the scope of the present invention.

The present application is based on

Japanese priority application No. 11-231957 filed on August 18, 1999, with the Japanese Patent Office, the entire contents of which are hereby incorporated by reference.

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WHAT IS CLAIMED IS

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1. An extension device having such a configuration as to be mounted in an extension bay of an information processing device and comprising an identification-information-acquisition unit.

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2. The extension device as claimed in claim 1, wherein said identification-information-acquisition unit includes a biological-information-acquisition unit for acquiring biological information.

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3. The extension device as claimed in claim 1, wherein said identification-information-acquisition unit includes an ID-card-reader unit for reading an ID card.

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4. The extension device as claimed in claim 1, wherein said identification-information-acquisition unit includes a personal-identification-number-entry unit for receiving a personal-identification-number code.

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5. The extension device as claimed in claim 2, wherein said biological information includes one of fingerprints, retinal patterns, voice, handwritings, and facial features.

5

6. The extension device as claimed in claim 1, wherein said identification-information-acquisition unit is provided on a side panel of said extension device that is exposed when said extension device is mounted in the extension bay.

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7. The extension device as claimed in claim 1, further comprising a matching unit which matches identification information entered in said identification-information-acquisition unit with registered identification information.

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8. An extension device having such a configuration as to be mounted in a container portion of an information processing device, comprising:

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an identification-information-acquisition unit which receives identification information; and  
a carrier unit which carries said identification-information-acquisition unit from a position where said identification-information-acquisition unit is encased in the container portion to a position where said identification-information-

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acquisition unit is situated outside the container portion so as to permit entry of identification information.

5

9. The extension device as claimed in claim 8, wherein said identification-information-acquisition unit includes a biological-information-acquisition unit for acquiring biological information.

15

10. The extension device as claimed in claim 9, wherein said biological information includes one of fingerprints, retinal patterns, voice, handwritings, and facial features.

25

11. The extension device as claimed in claim 8, wherein said identification-information-acquisition unit is configured to be detachable from said carrier unit.

30

12. The extension device as claimed in claim 11, wherein said identification-information-acquisition unit is connectable to the information processing device through a cable when said identification-information-acquisition unit is

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detached from said carrier unit.

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13. The extension device as claimed in claim 11, wherein said identification-information-acquisition unit includes:

10 a left-hand-side connector which is to be connected to said extension device when said extension device is mounted in a left-hand side of the information processing device; and

15 a right-hand-side connector which is to be connected to said extension device when said extension device is mounted in a right-hand side of the information processing device.

20

14. The extension device as claimed in claim 11, wherein said identification-information-acquisition unit includes a front-side connector which is to be connected to said extension device  
25 when said extension device is mounted in a front side of the information processing device.

30

15. The extension device as claimed in claim 11, wherein said identification-information-acquisition unit includes a cable having a connector provided at a tip thereof, said identification-  
35 information-acquisition unit being connectable to a connector of the extension device via said cable when said identification-information-acquisition

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17. An identification-information-  
25 acquisition device to be detachably mounted in an  
extension device which has such a configuration as  
to be mounted in a container portion of an  
information processing device, and which includes a  
carrier unit that moves from a position where said  
30 carrier unit is encased in the container portion to  
a position where said carrier unit is situated  
outside the container portion, said identification-  
information-acquisition device comprising an  
identification-information-acquisition unit which  
35 receives identification information, wherein the  
carrier unit moves said identification-information-  
acquisition unit from an encased position to a

position where the identification information can be  
entered in said identification-information-  
acquisition unit when said identification-  
information-acquisition device is mounted on the  
5 carrier unit.

10 18. The identification-information-  
acquisition device as claimed in claim 17, wherein  
said identification-information-acquisition unit  
includes a biological-information-acquisition unit  
for acquiring biological information.

15

20 19. The identification-information-  
acquisition device as claimed in claim 18, wherein  
said biological information includes one of  
fingerprints, retinal patterns, voice, handwritings,  
and facial features.

25

20. An information processing device,  
comprising:  
30 a case;  
an identification-information-acquisition  
unit which receives identification information;  
a container unit which is provided in  
association with said case, and stores said  
35 identification-information-acquisition unit therein;  
and  
a carrier unit which carries said

identification-information-acquisition unit from a position where said identification-information-acquisition unit is encased in said container unit to a position where said identification-information-acquisition unit is situated outside said container unit.

10

21. The information processing device as claimed in claim 20, wherein said identification-information-acquisition unit includes a biological-information-acquisition unit for acquiring biological information.

20

22. The information processing device as claimed in claim 21, wherein said biological information includes one of fingerprints, retinal patterns, voice, handwritings, and facial features.

25

23. The information processing device as claimed in claim 20, wherein said identification-information-acquisition unit is configured to be detachable from said carrier unit.

35

24. An identification-information-acquisition device to be detachably mounted in an

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27. The identification-information-acquisition device as claimed in claim 24, wherein said identification-information-acquisition unit is configured to be detachable from said carrier unit.

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28. An extension device having such a configuration as to be mounted in a container portion of an information processing device, comprising:

a fingerprint-reading unit which detects a fingerprint; and

15 a carrier unit which carries said fingerprint-reading unit from a position where said fingerprint-reading unit is encased in the container portion to a position where said fingerprint-reading unit is situated outside the container portion so as to permit reading of a fingerprint.

25 29. The extension device as claimed in claim 28, detachably mounted in the container portion that is configured to receive therein any one of a plurality of different types of extension devices.

30

30. The extension device as claimed in claim 28, wherein the information processing device is a portable-type information processing device, said container unit being provided with said

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portable-type information processing device.

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31. An information processing device,  
comprising:

a container unit in which an extension  
device is detachably stored;

10 a fingerprint-reading unit which detects a  
fingerprint; and

a carrier unit which carries said  
fingerprint-reading unit from a position where said  
fingerprint-reading unit is encased in the extension  
15 device to a position where said fingerprint-reading  
unit is situated outside the extension device so as  
to permit reading of a fingerprint.

20

32. The information processing device as  
claimed in claim 31, wherein said information  
processing device is a portable-type information  
25 processing device.

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33. The information processing device as  
claimed in claim 31, further comprising a matching  
unit which attends to fingerprint matching with  
respect to data read by said fingerprint-reading  
unit.

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**ABSTRACT OF THE DISCLOSURE**

An extension device has such a configuration as to be mounted in an extension bay of an information processing device, and includes an  
5 identification-information-acquisition unit.

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FIG.1A

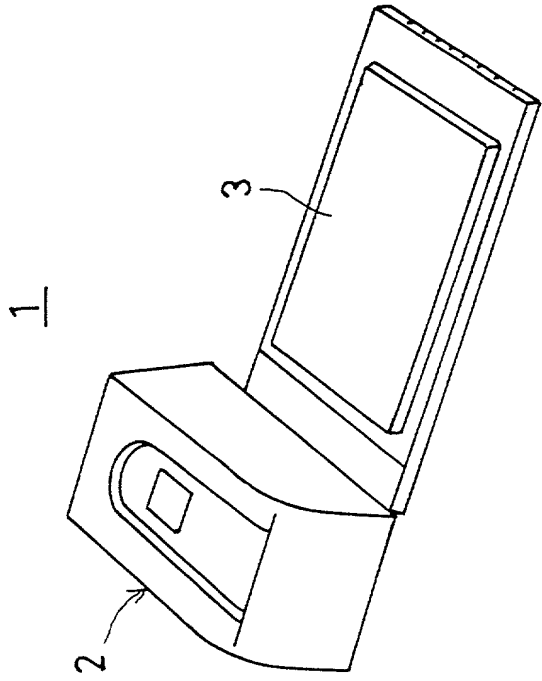


FIG.1B

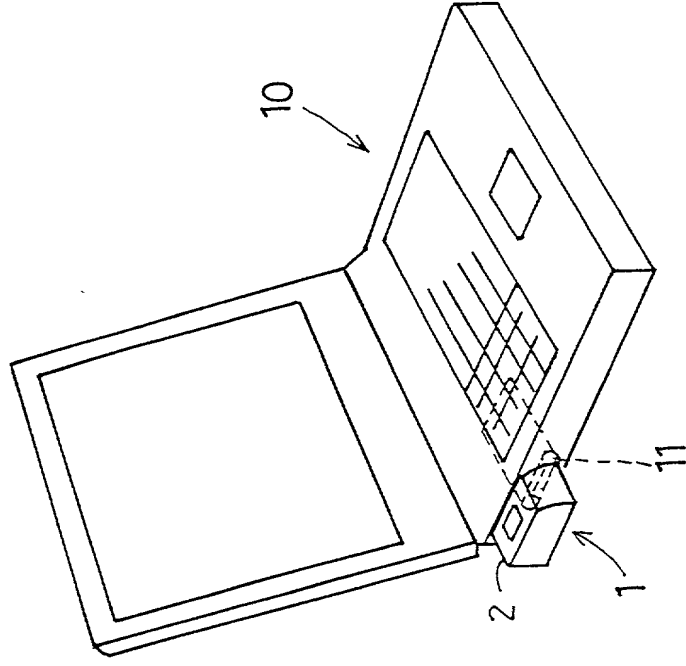


FIG.2

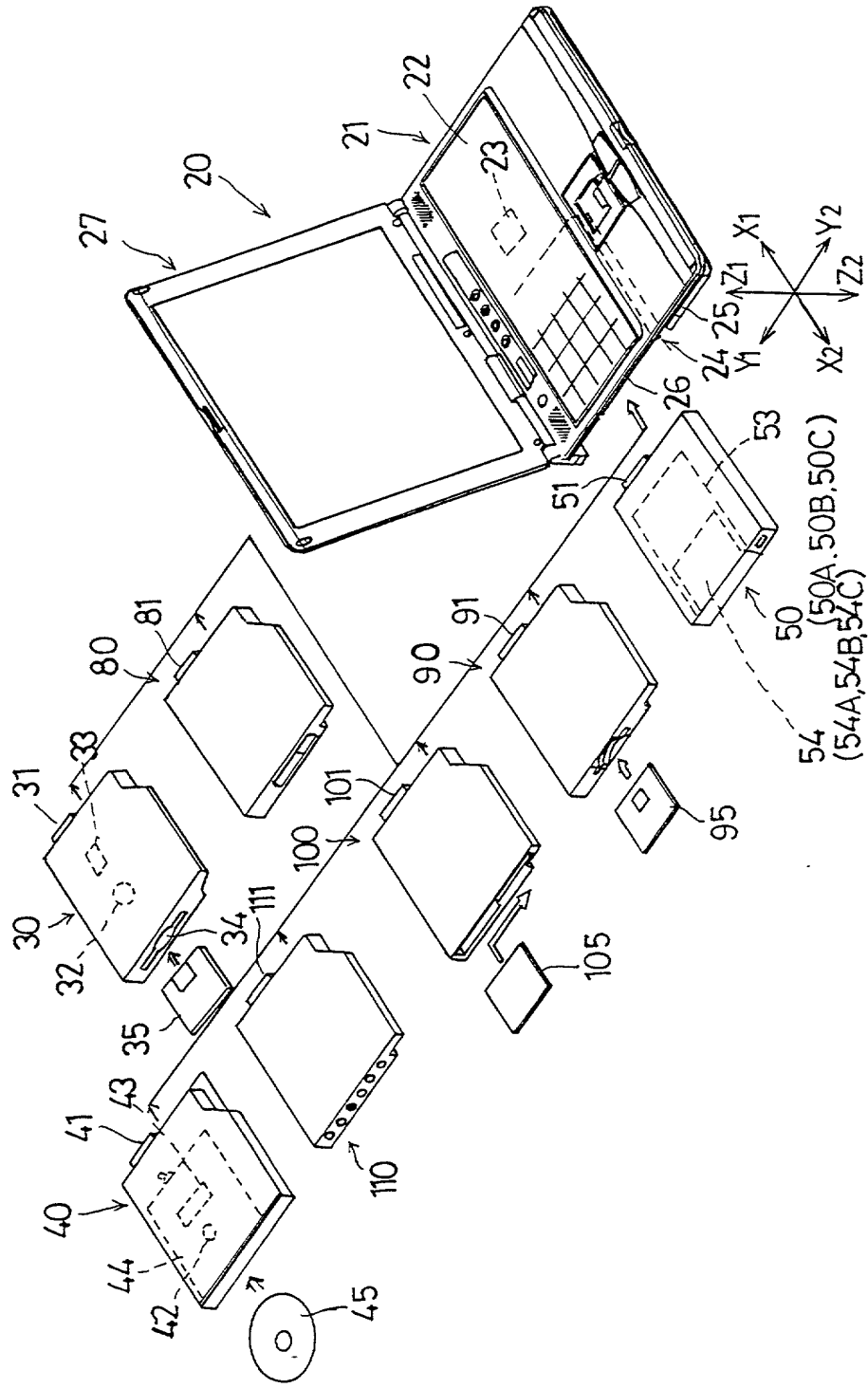


FIG.3

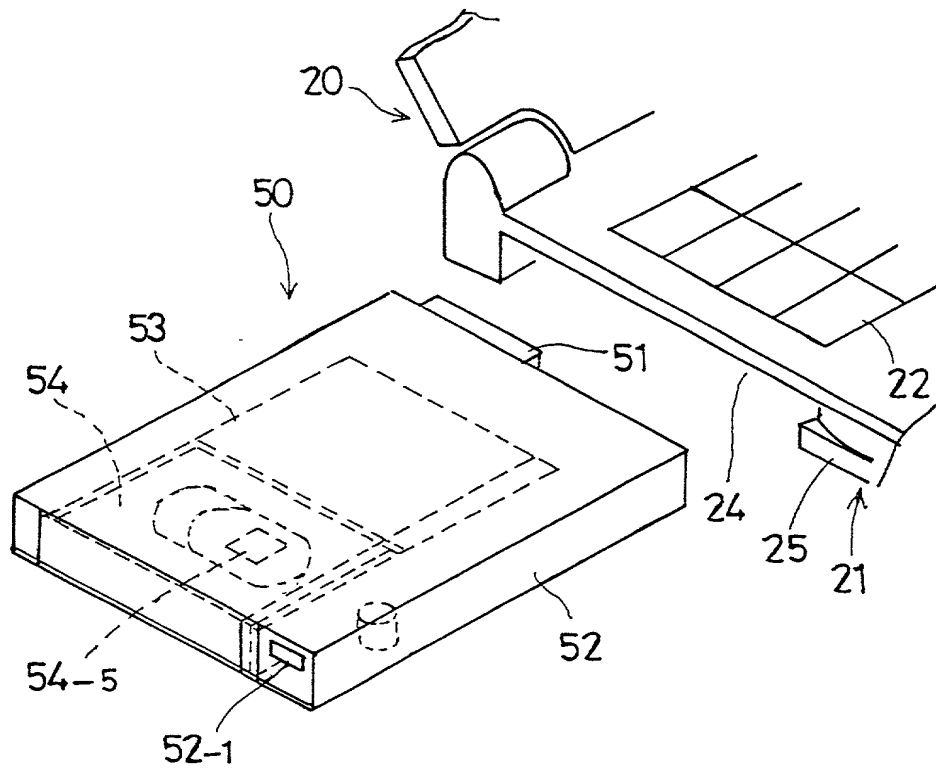
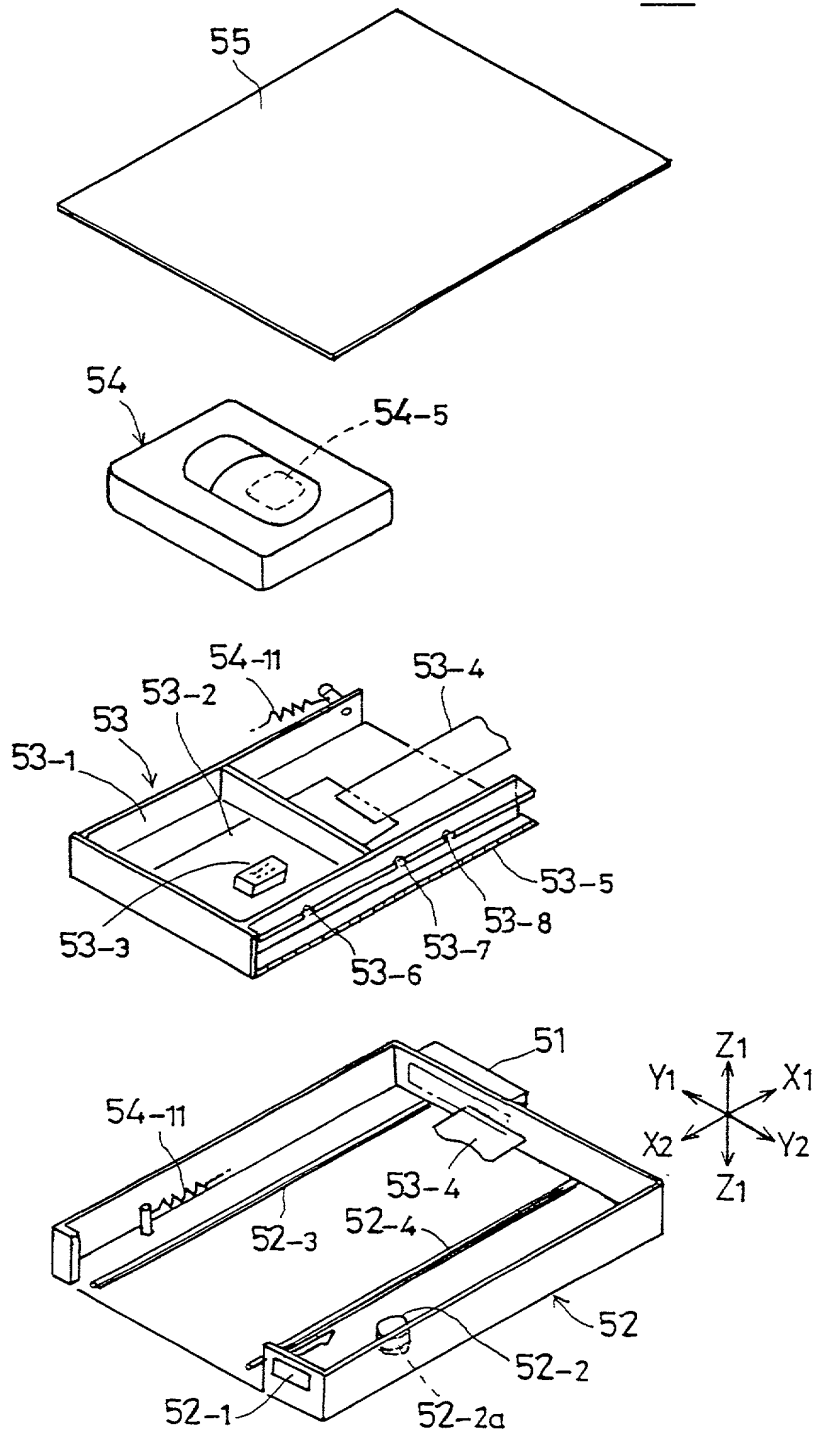


FIG.4

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**FIG.5**

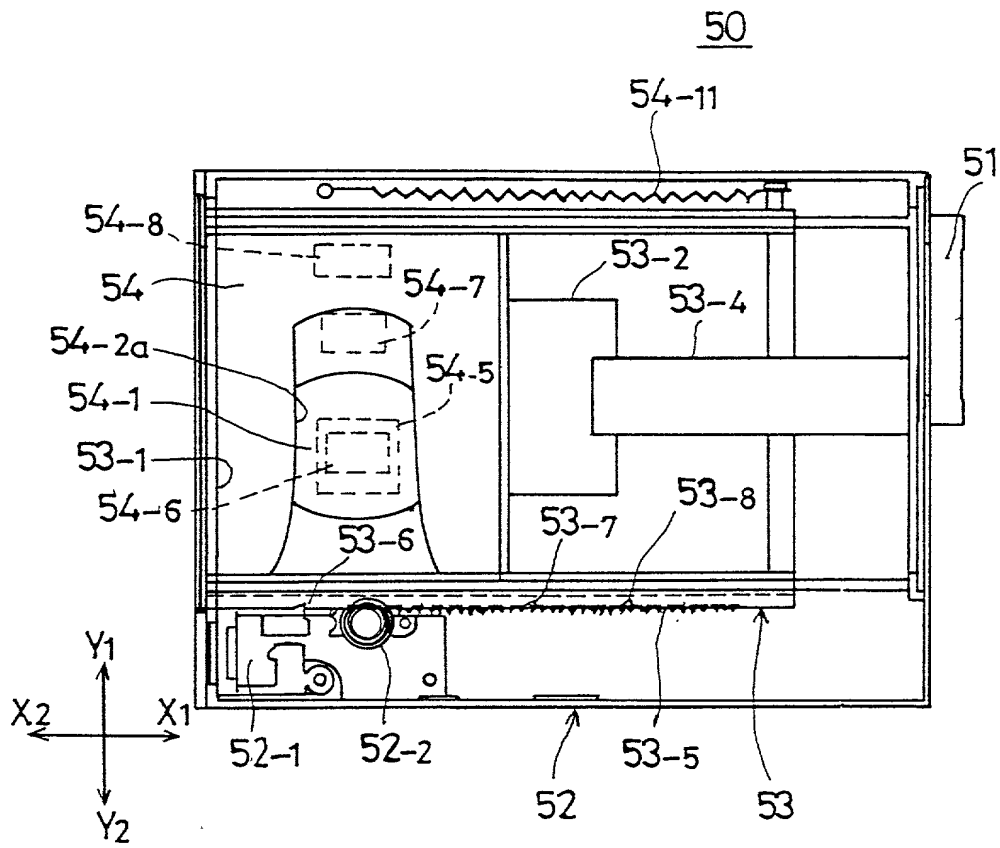


FIG.6A

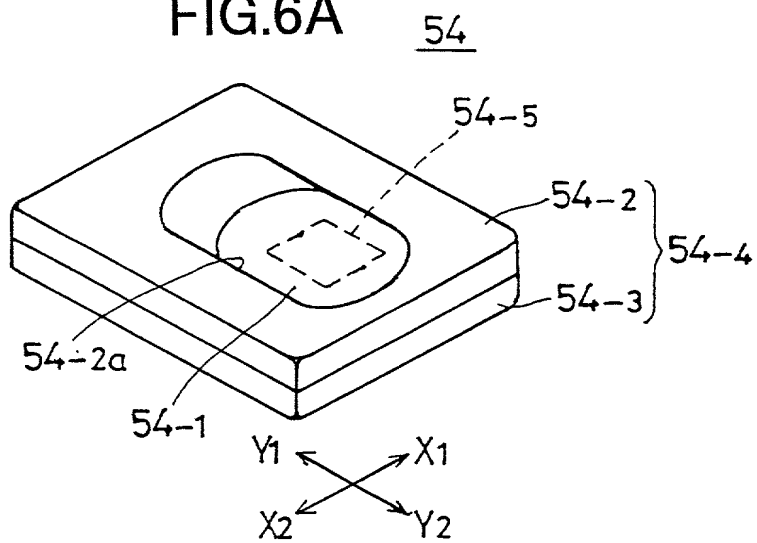


FIG.6B

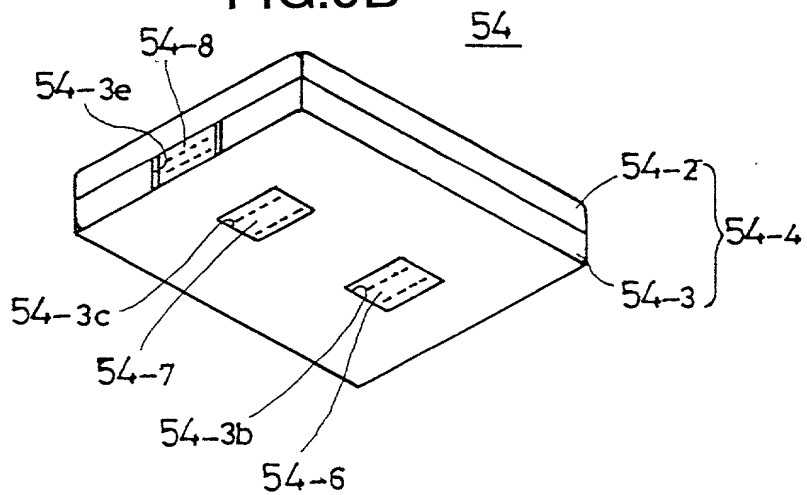


FIG.7A

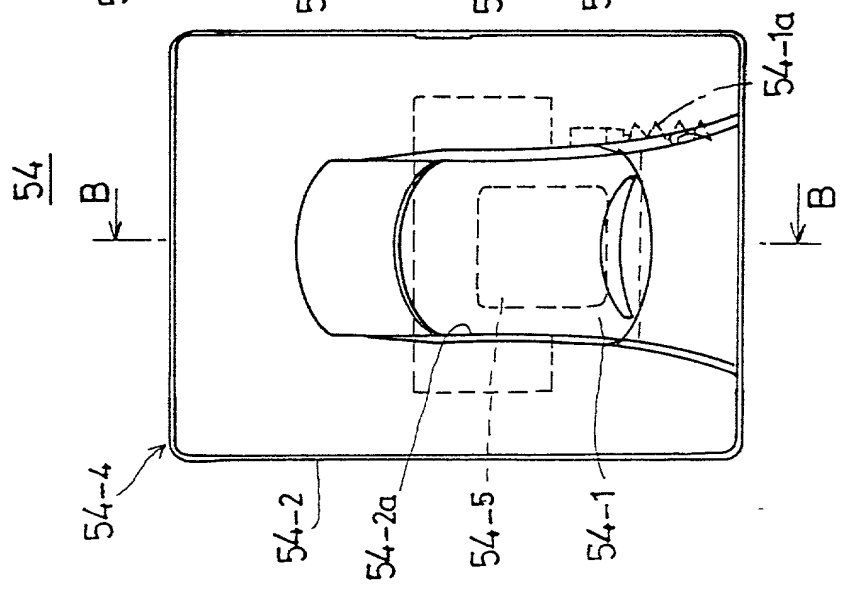


FIG.7B

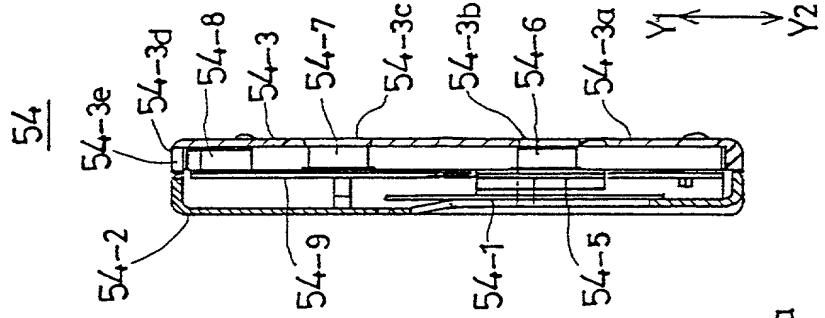


FIG.7C

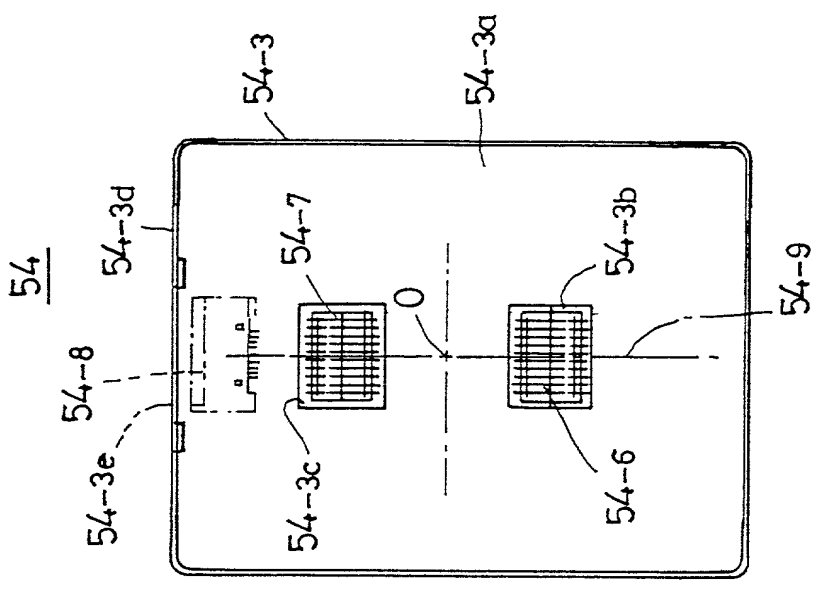




FIG. 8

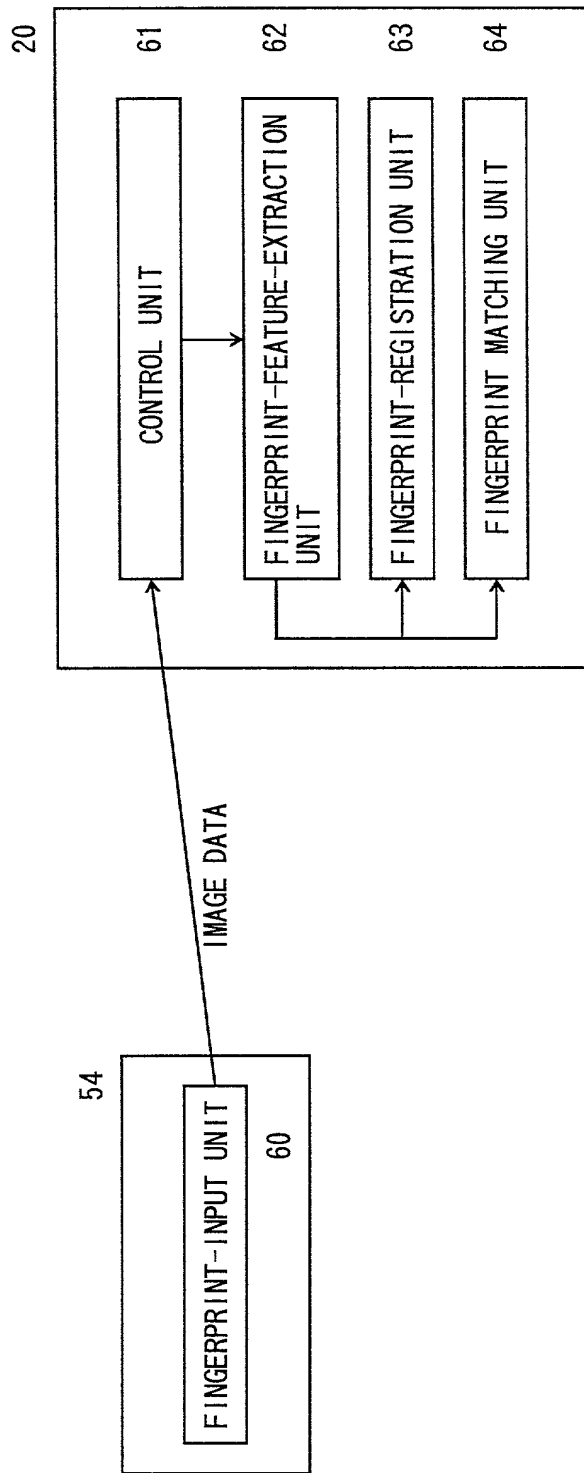


FIG.9

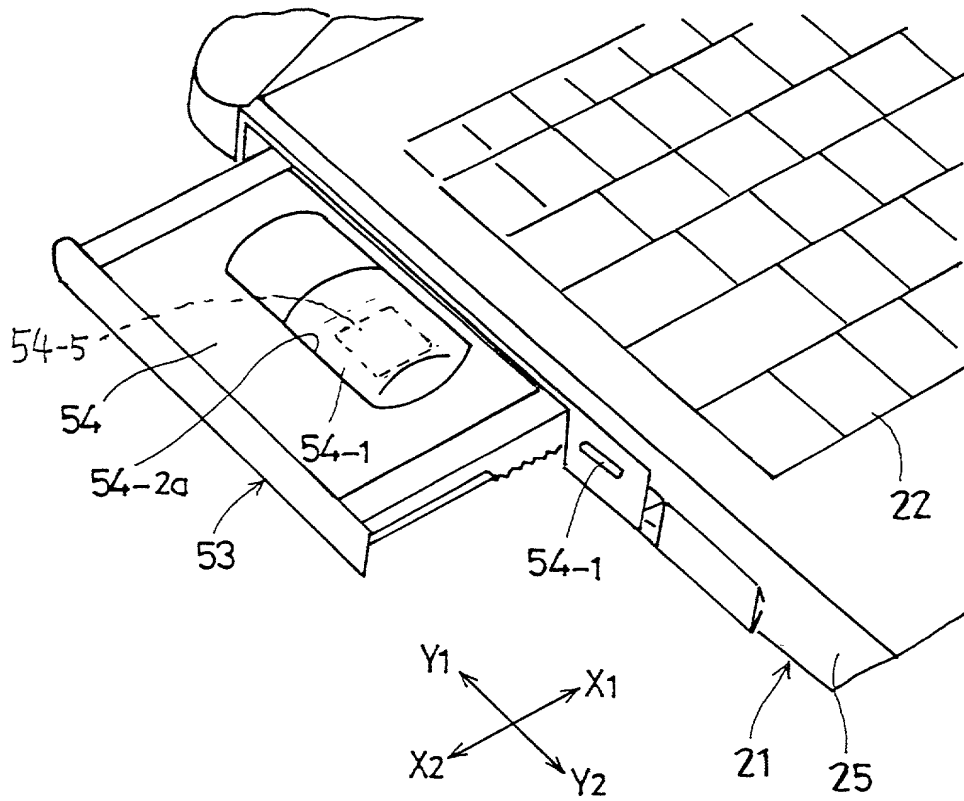




FIG.11

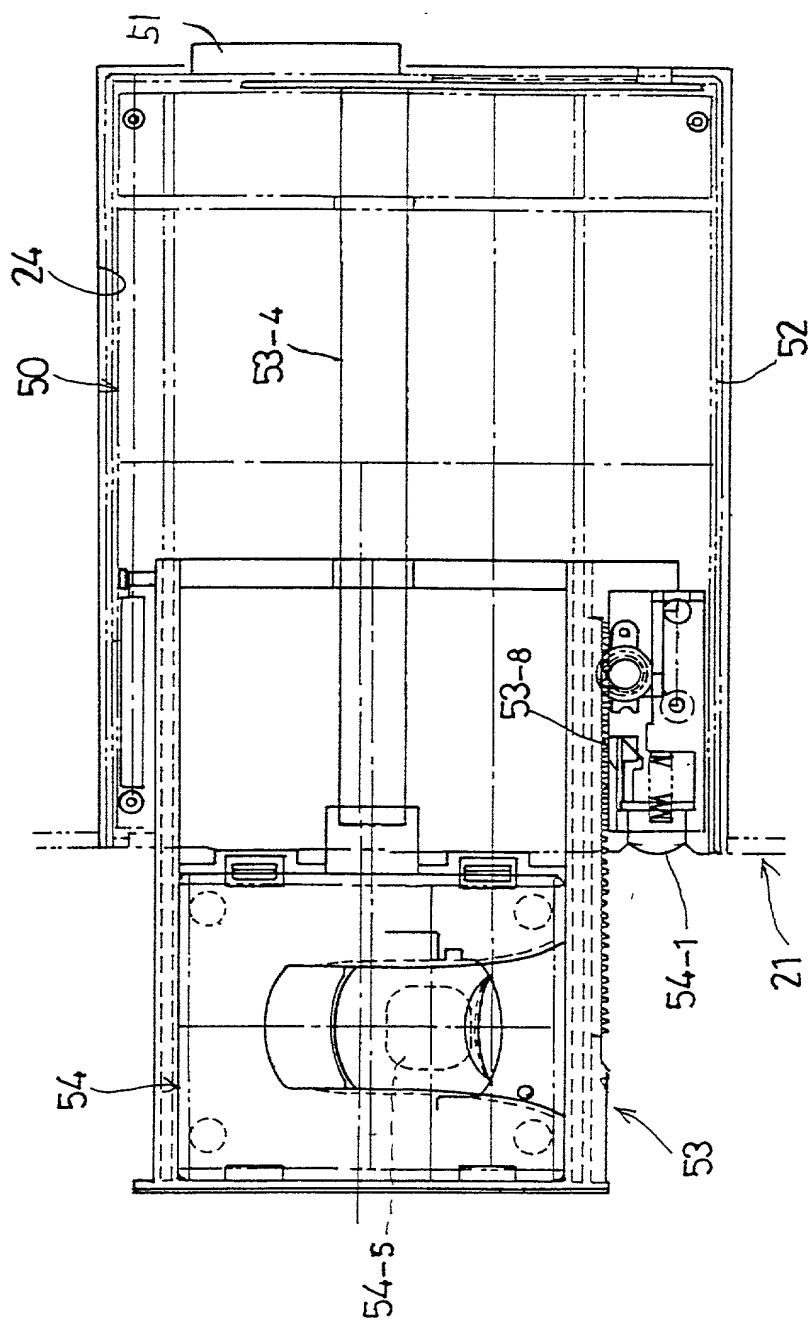
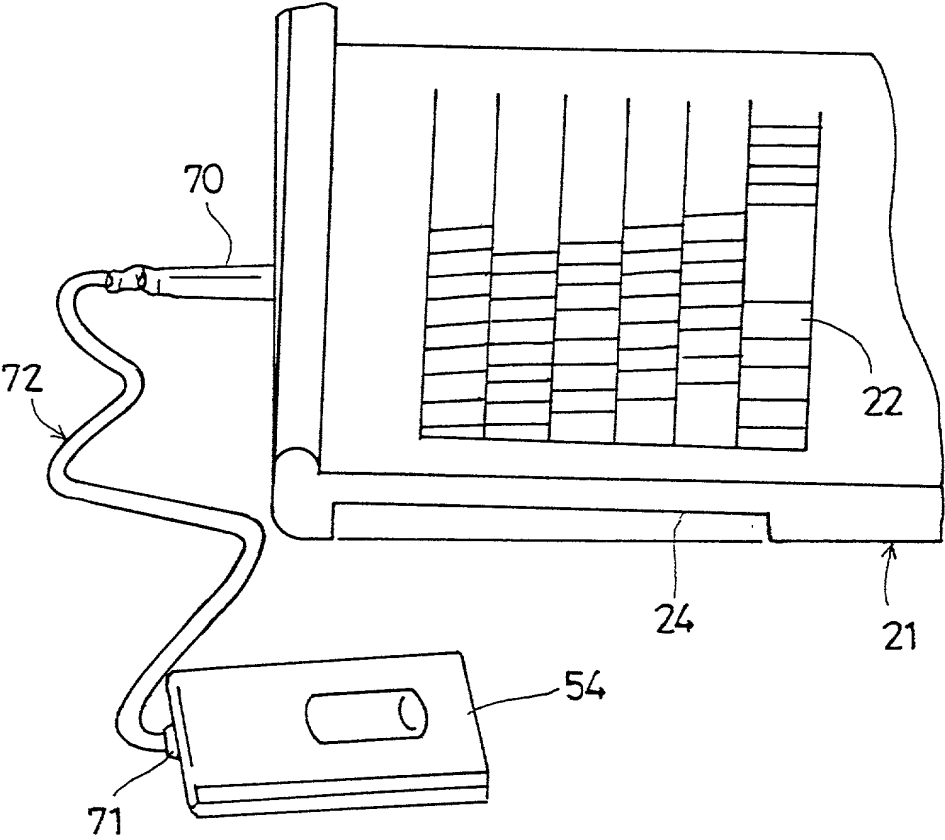


FIG.12



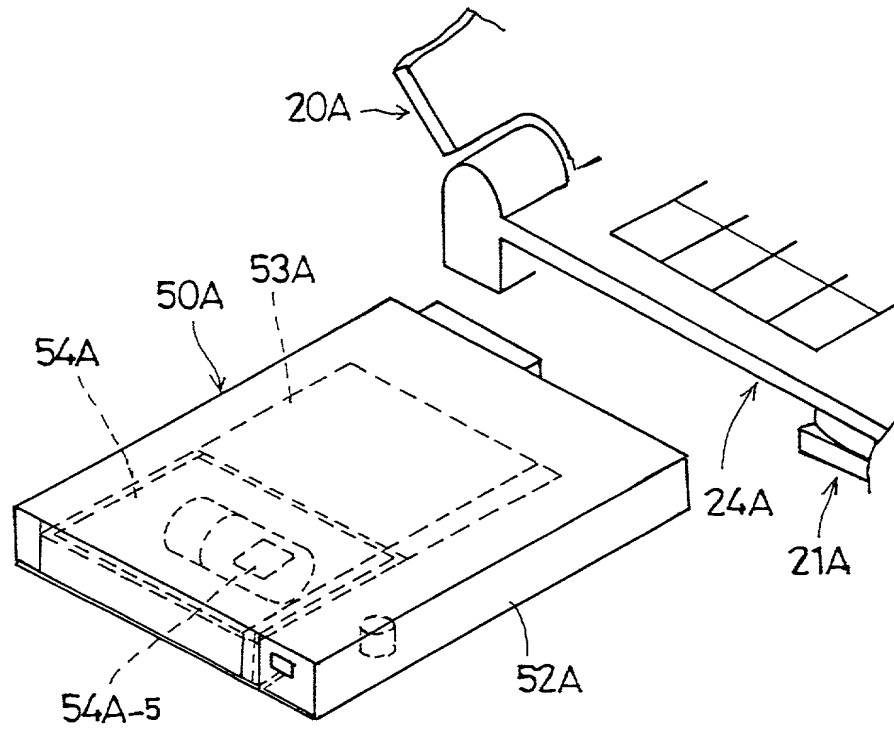


FIG. 14

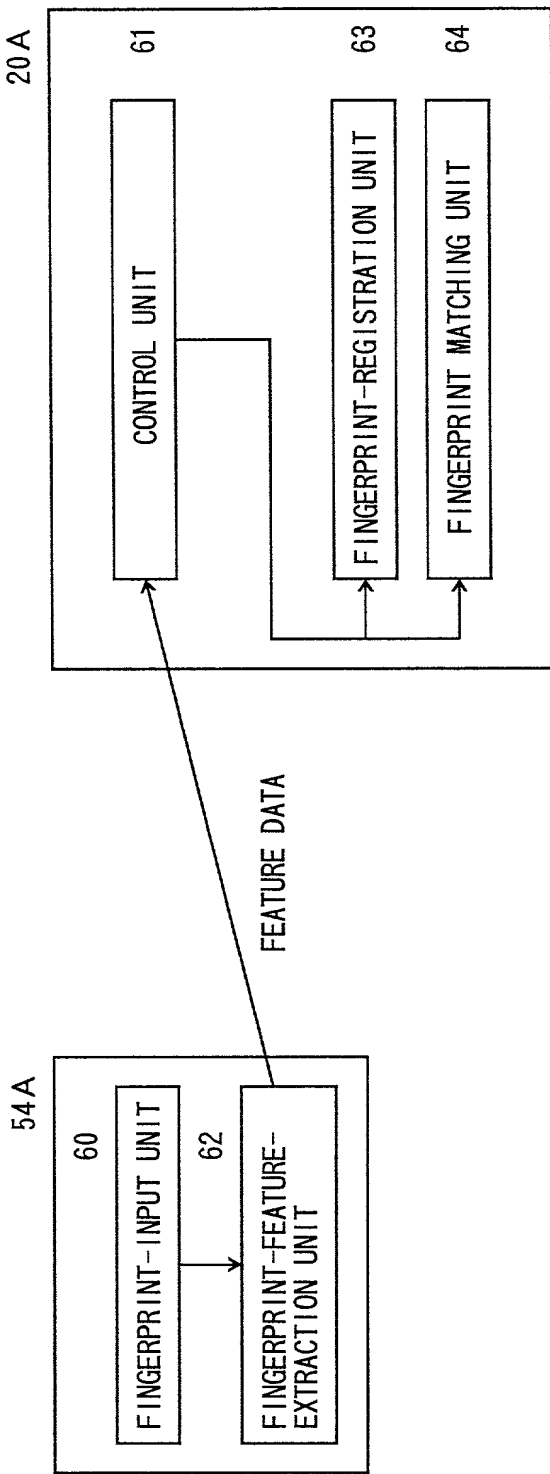


FIG.15

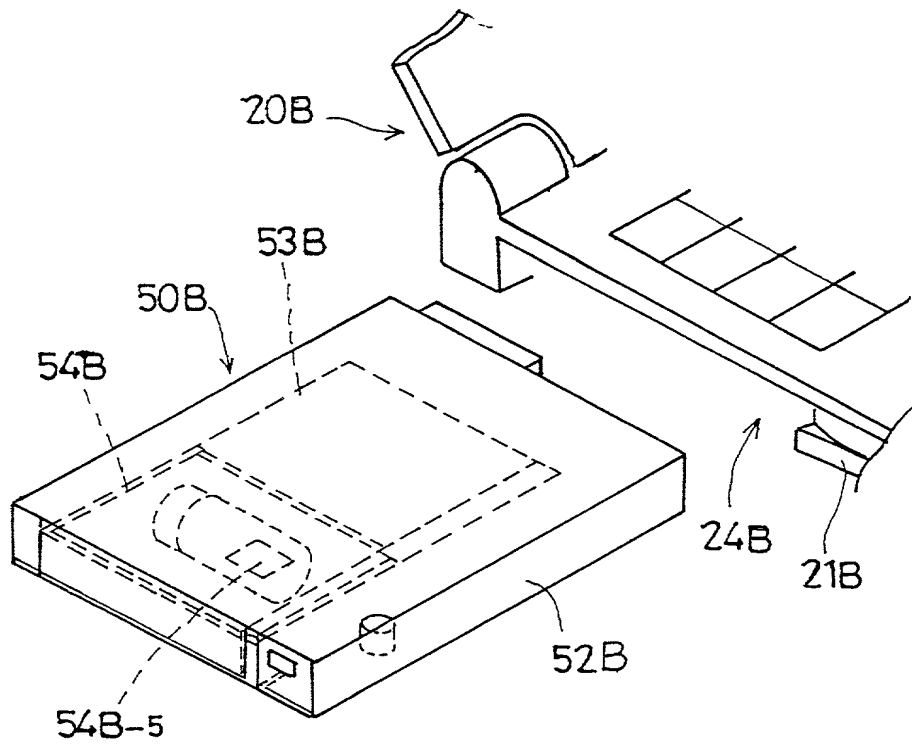




FIG. 16

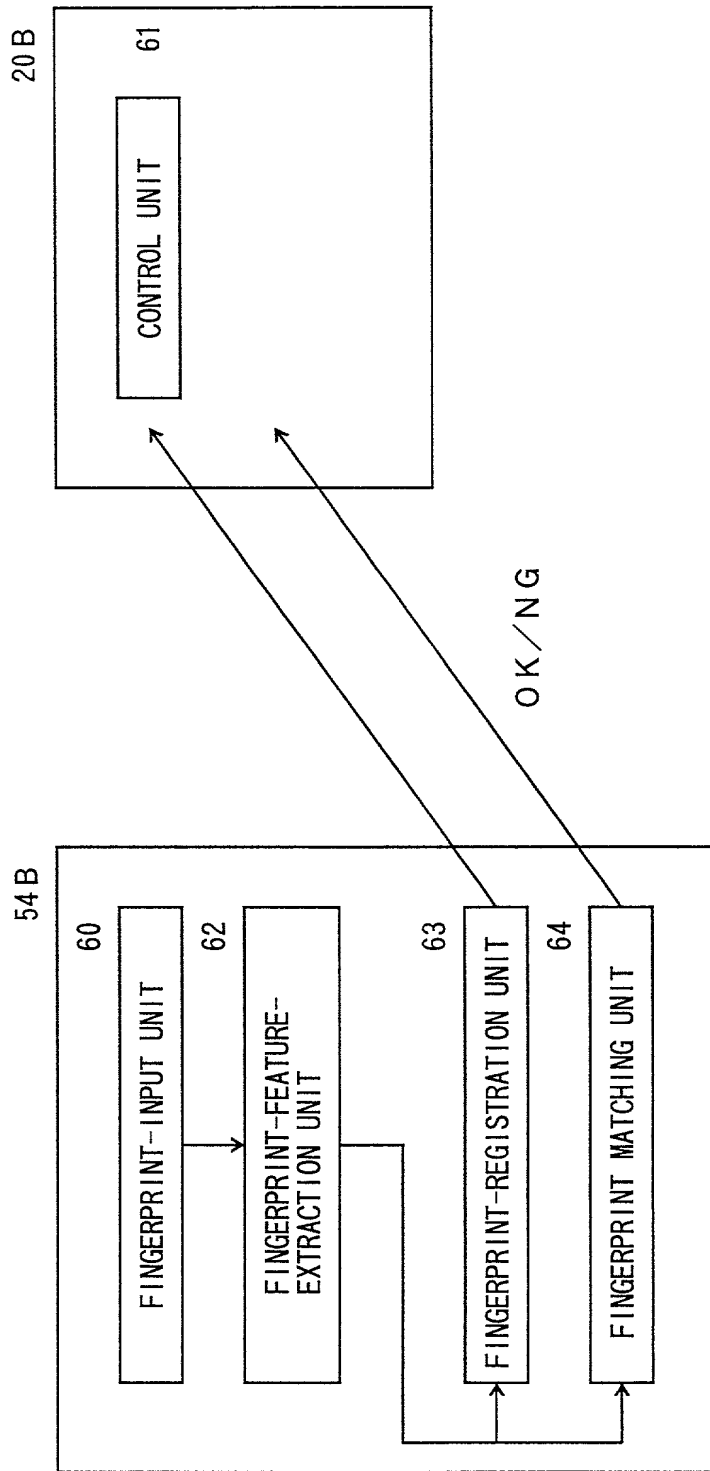
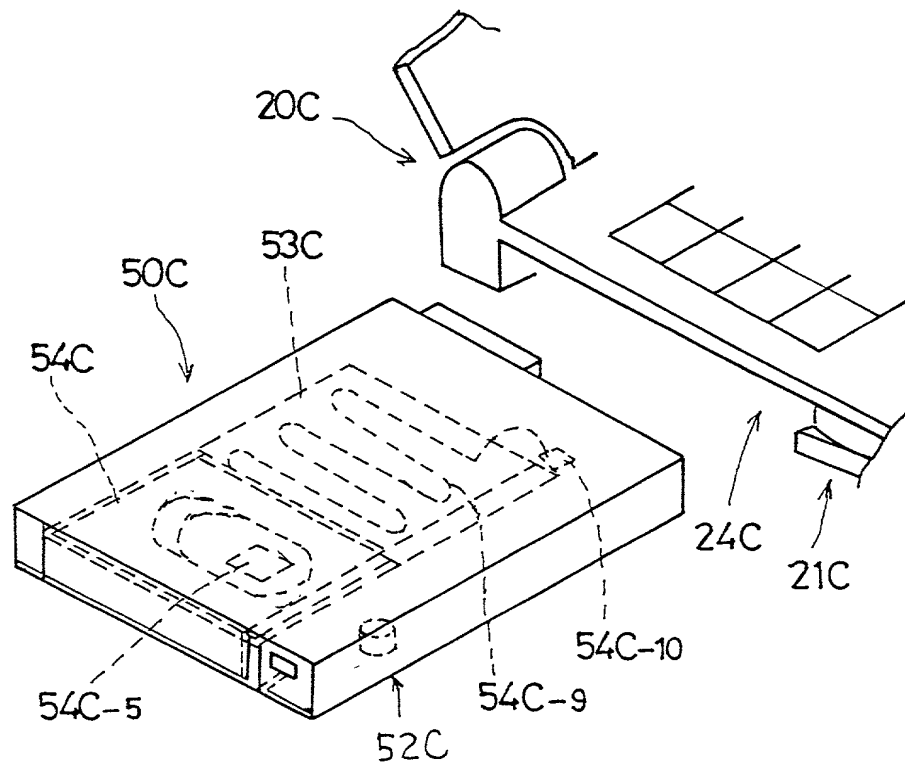


FIG.17



# FIG.18

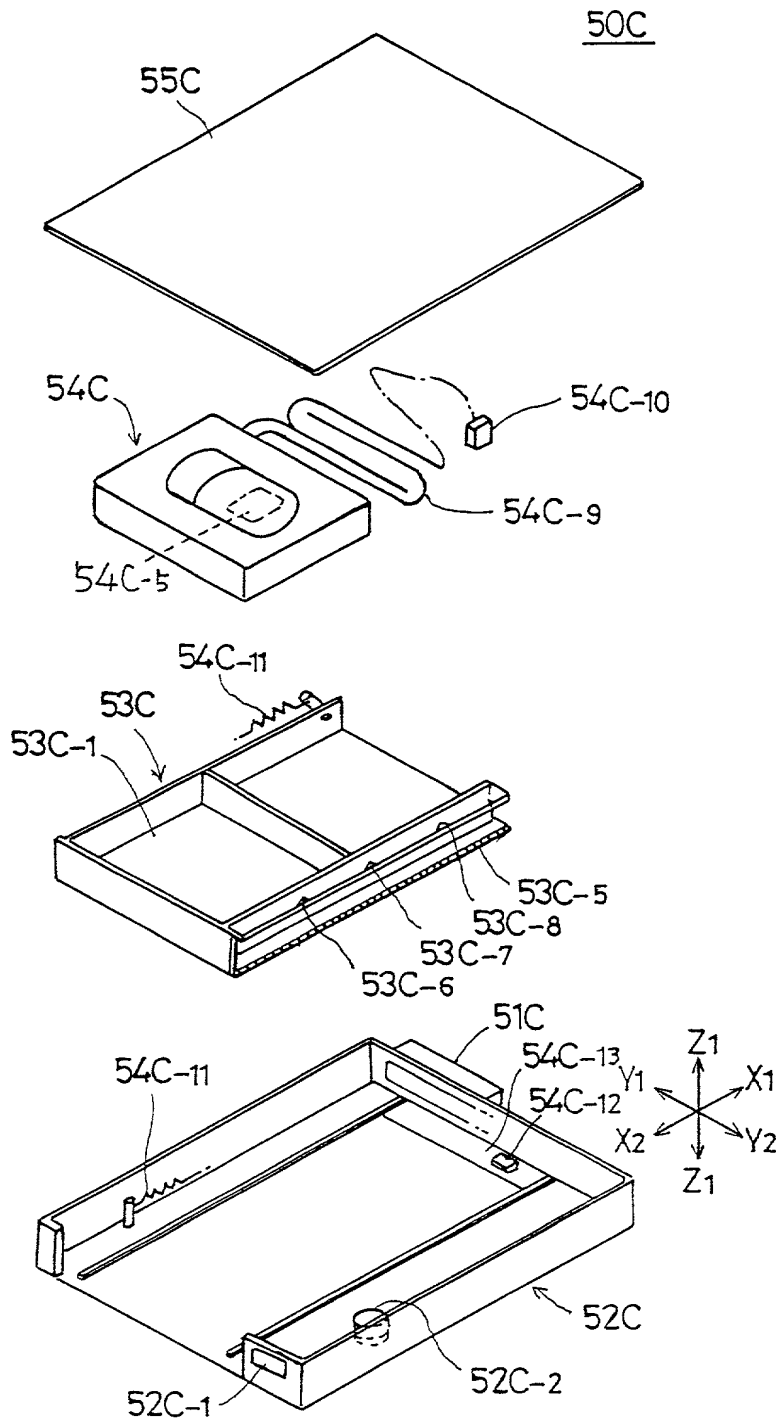


FIG.19A

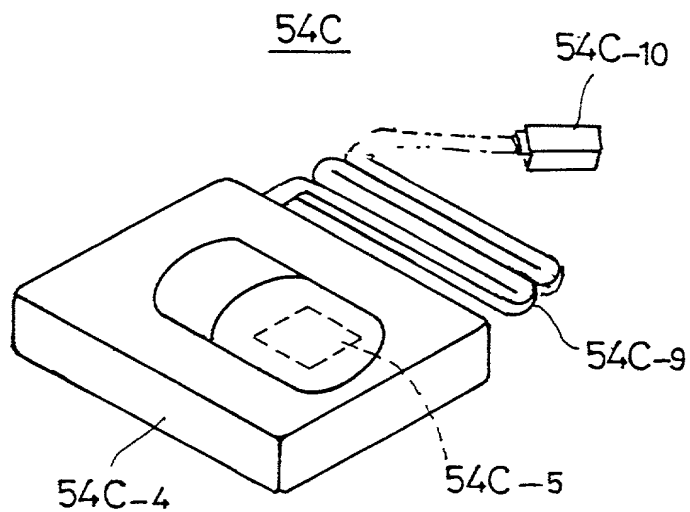


FIG.19B

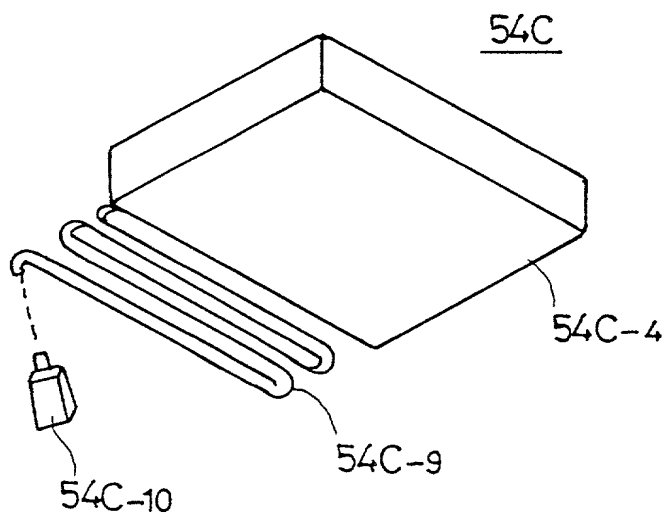




FIG.21

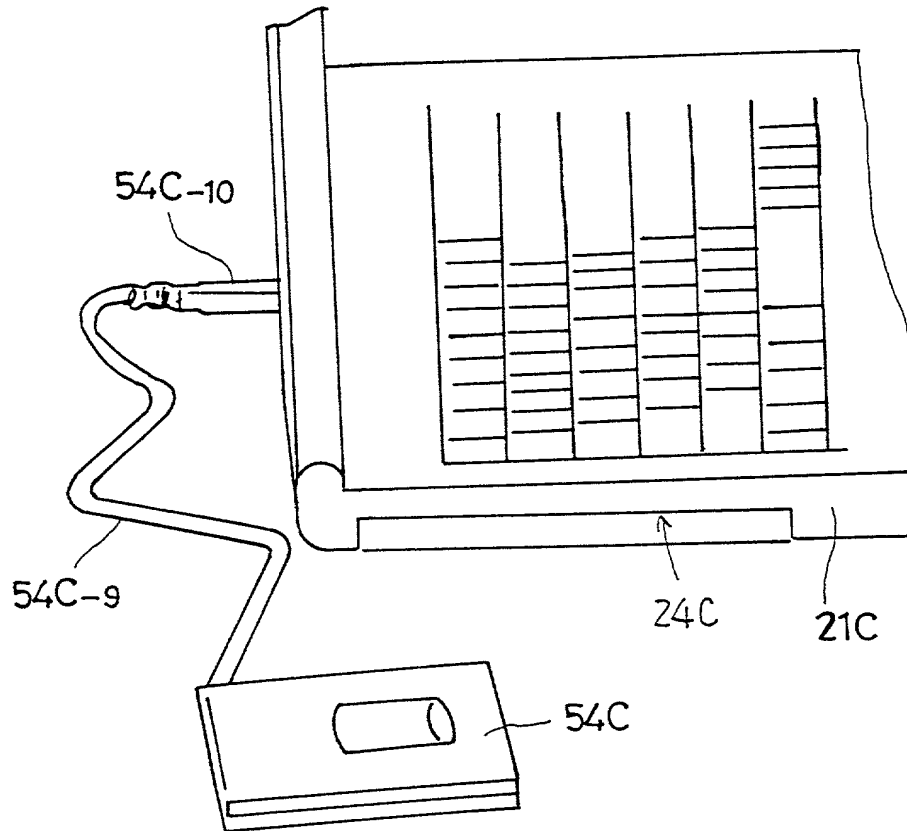


FIG.22

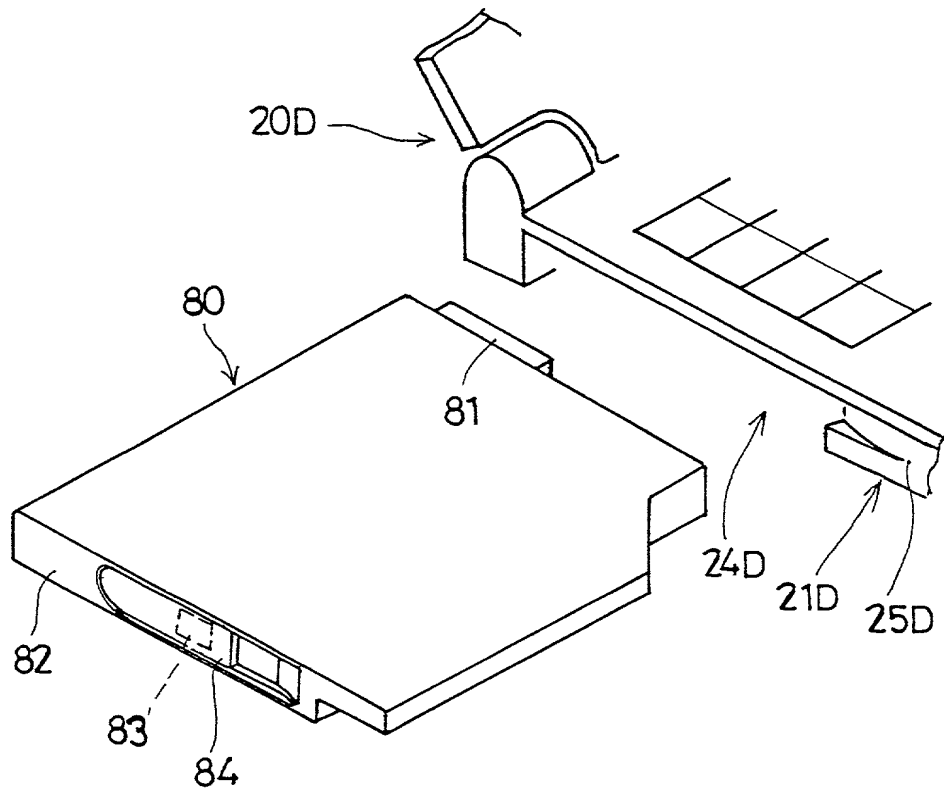


FIG.23

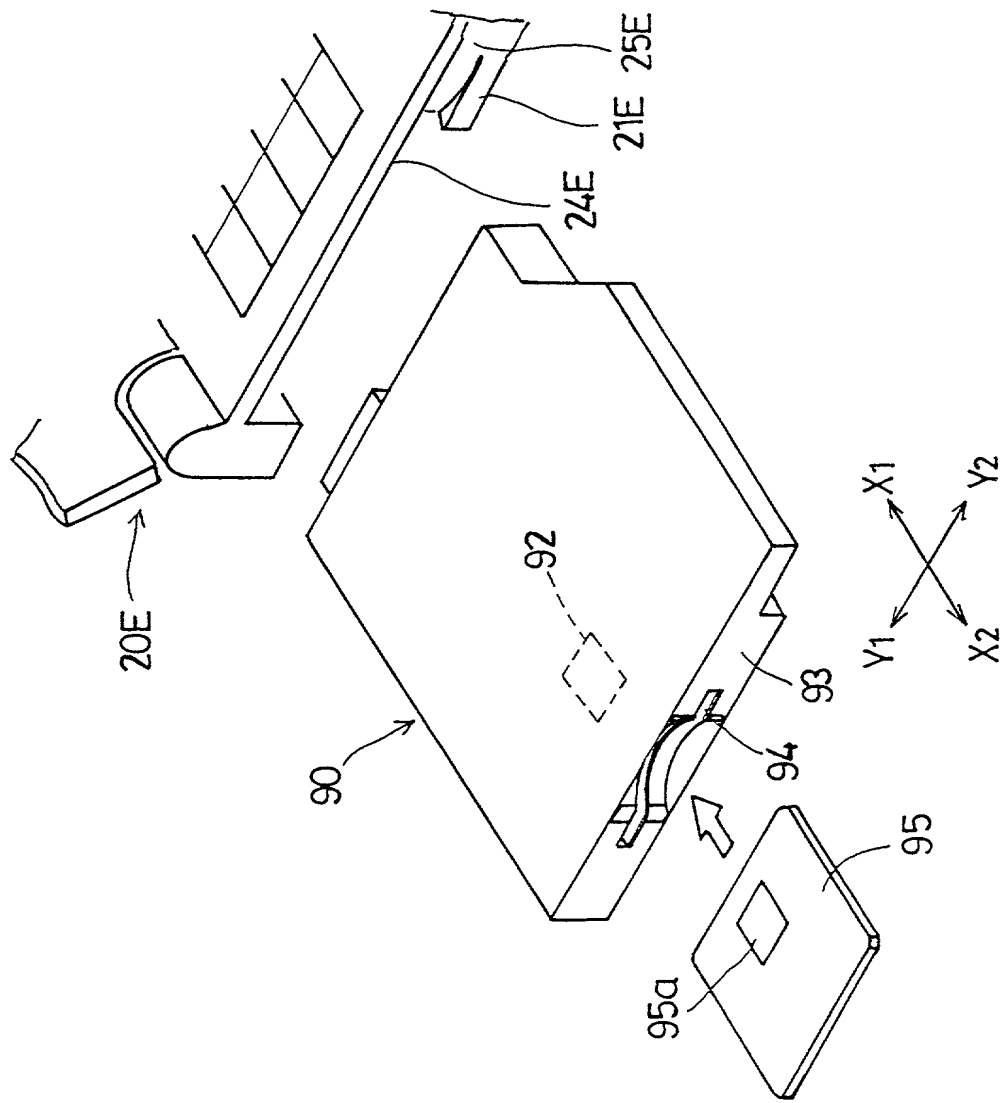




FIG. 24

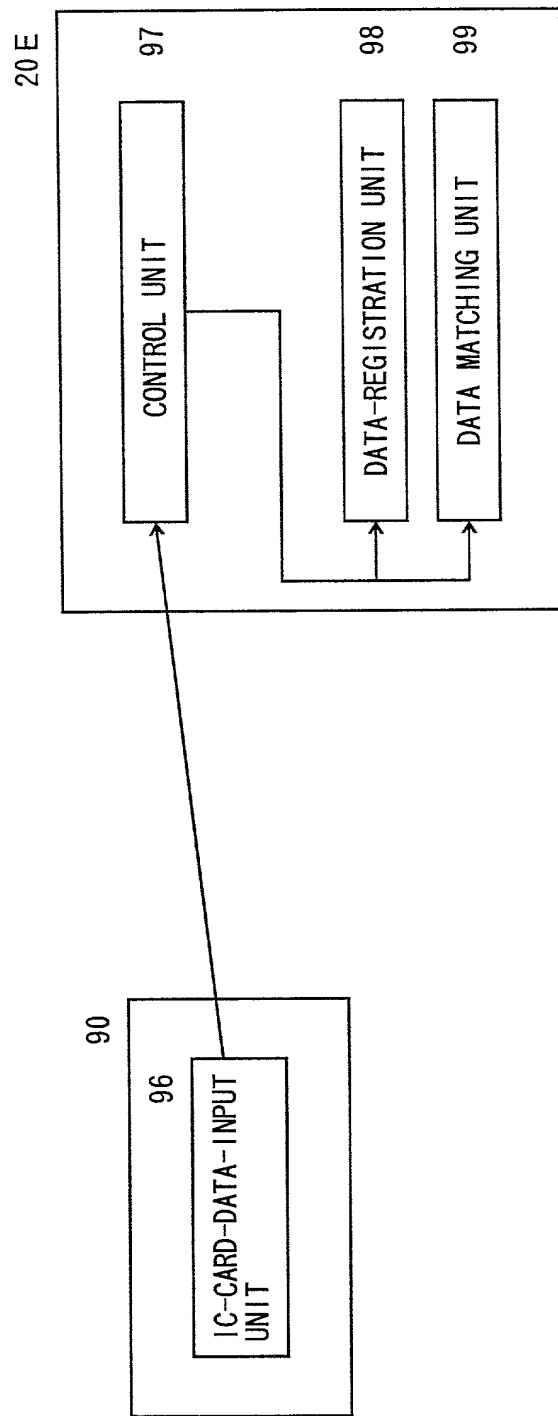


FIG.25

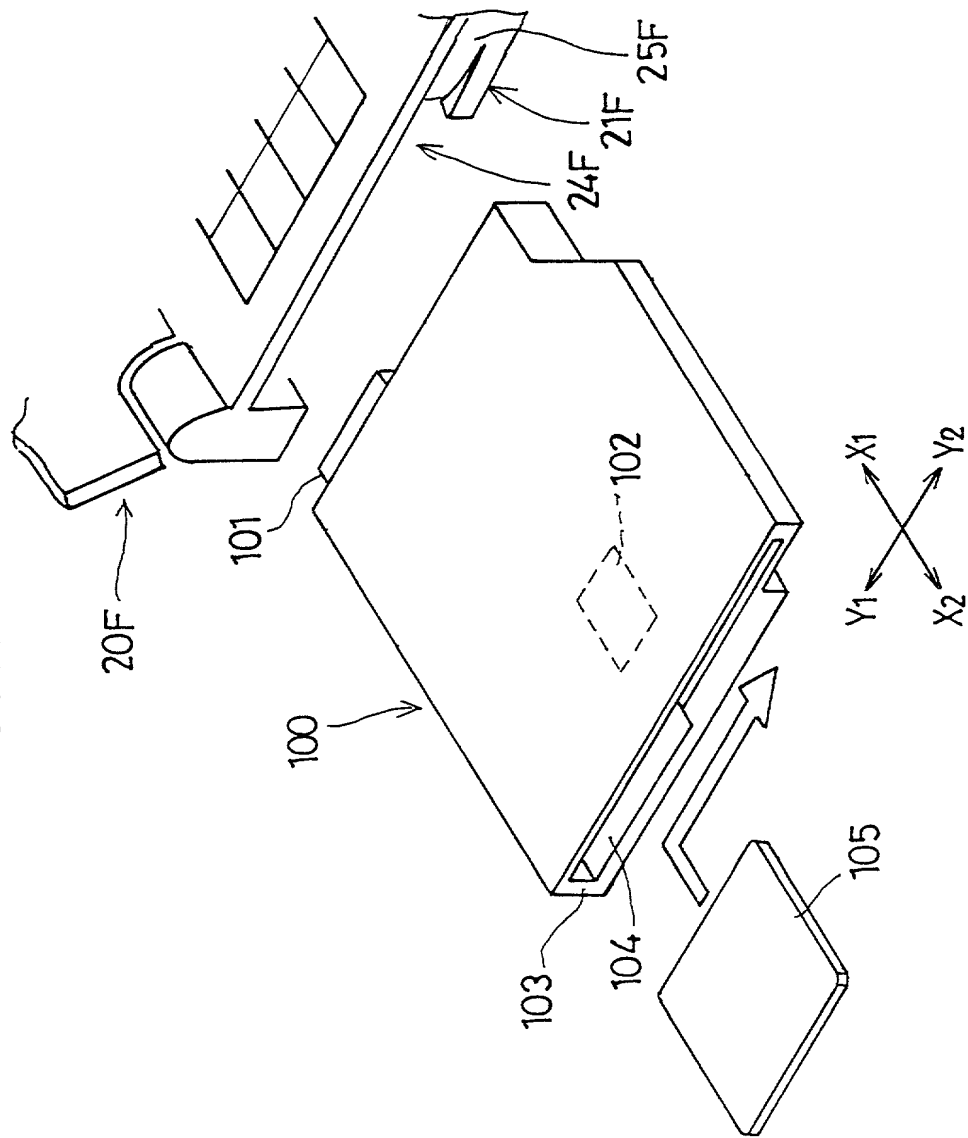


FIG. 26

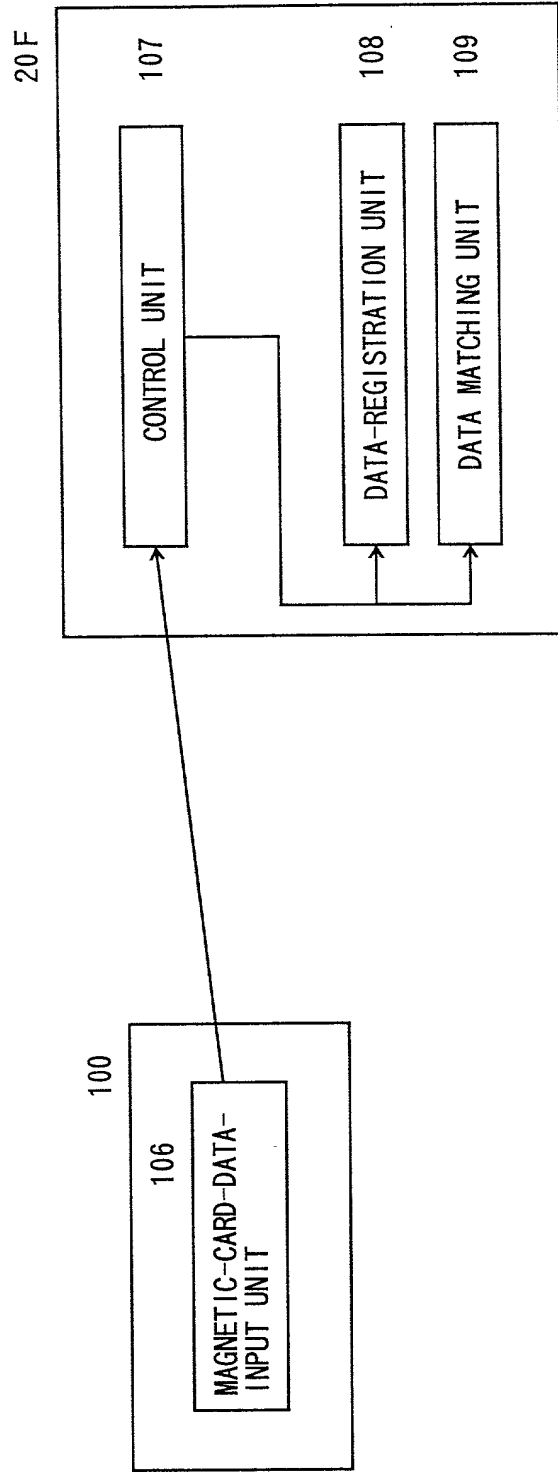


FIG.27

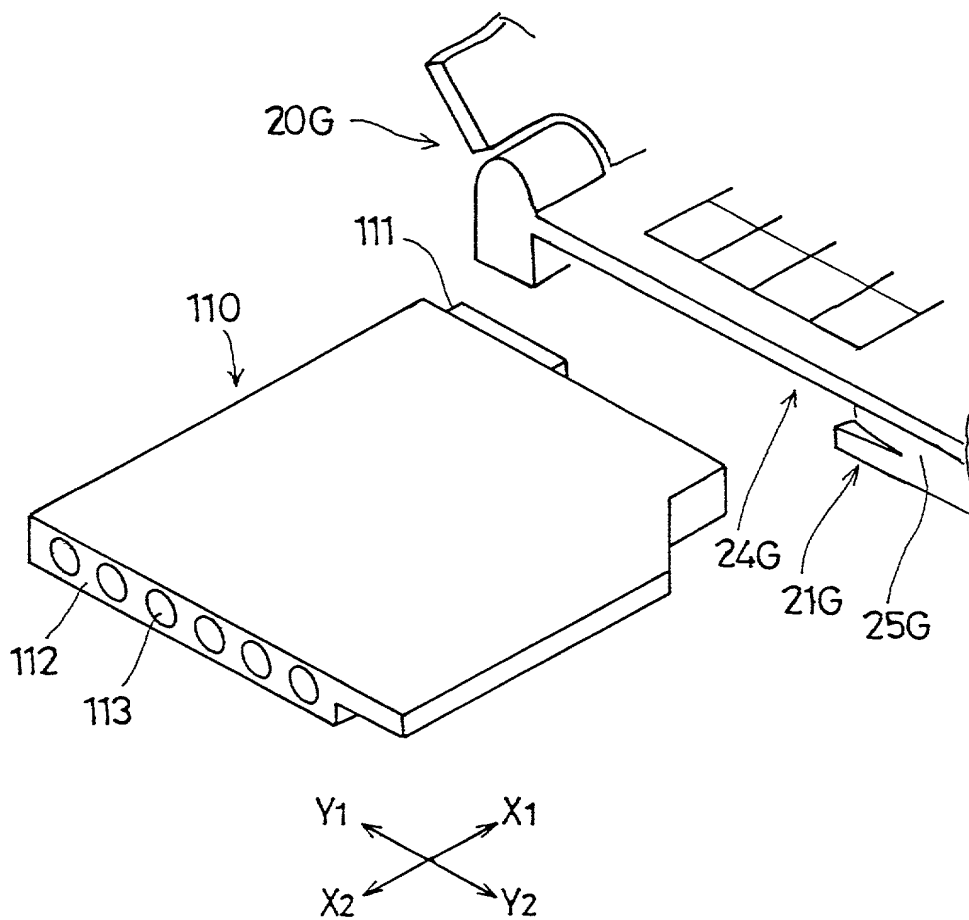


FIG. 28

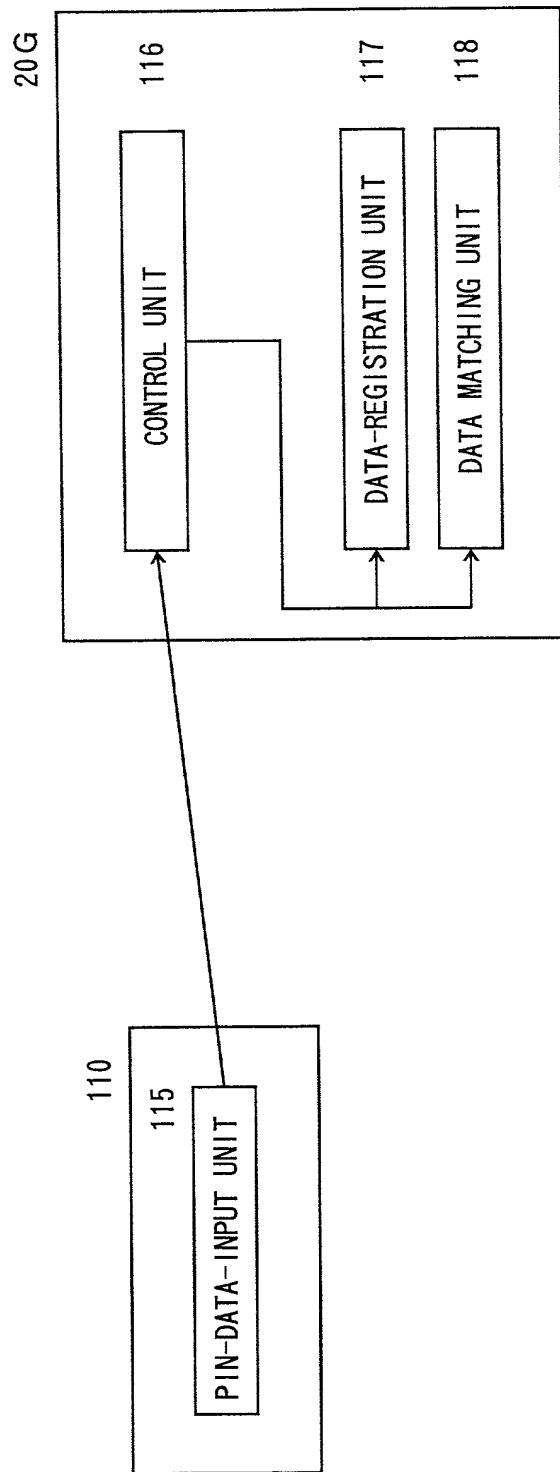
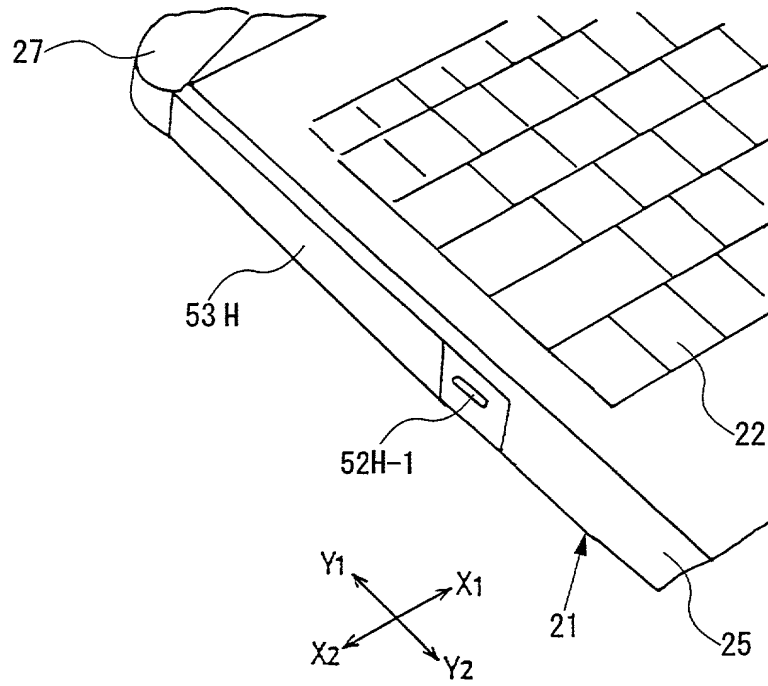


FIG. 29



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FIG. 30

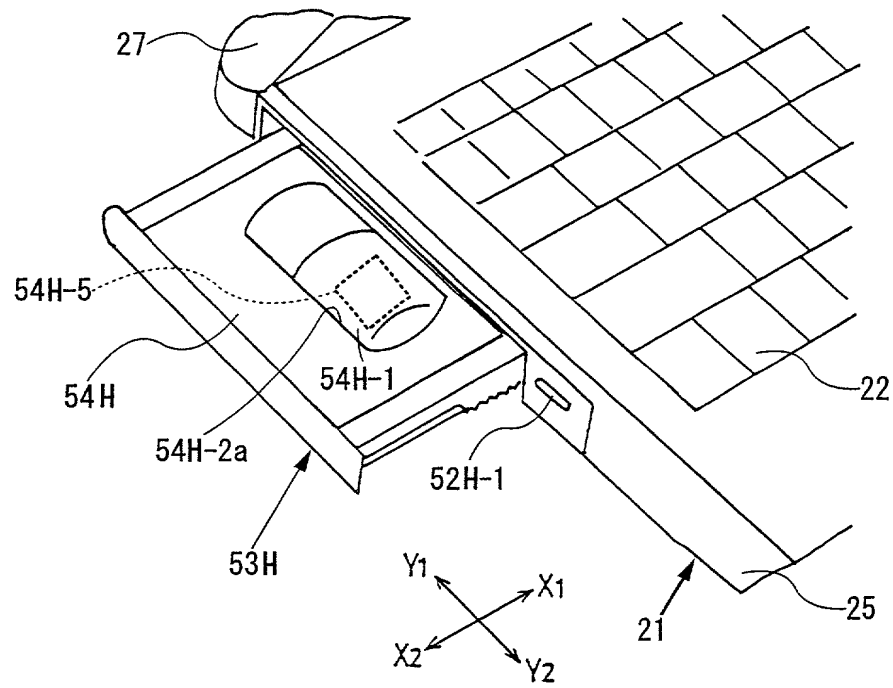


FIG. 31

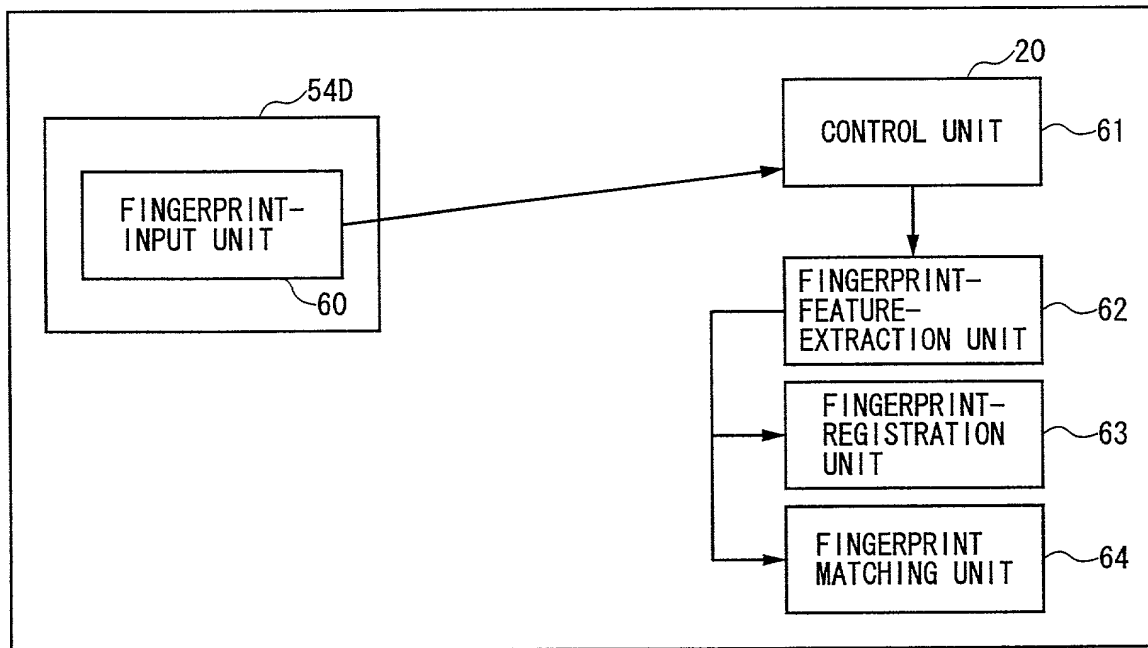
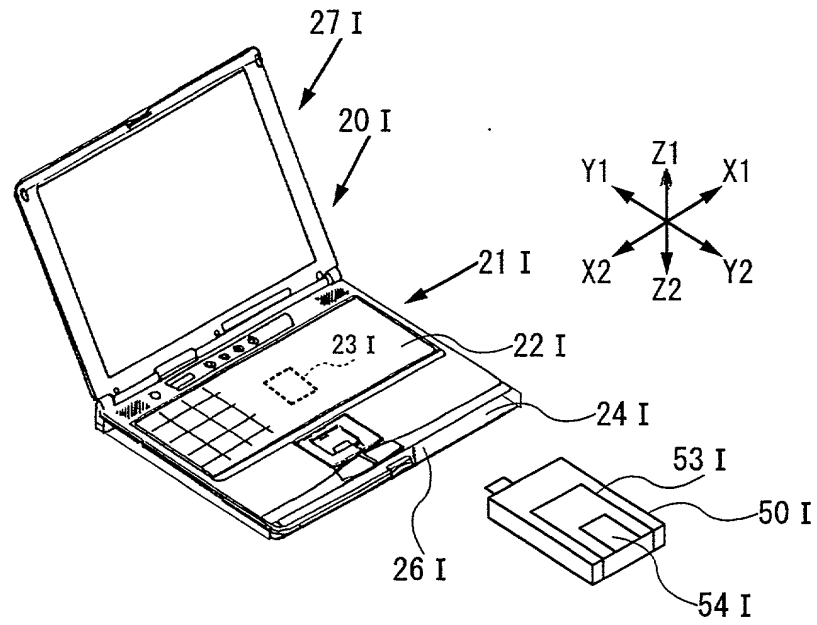




FIG. 32



# FIG. 33

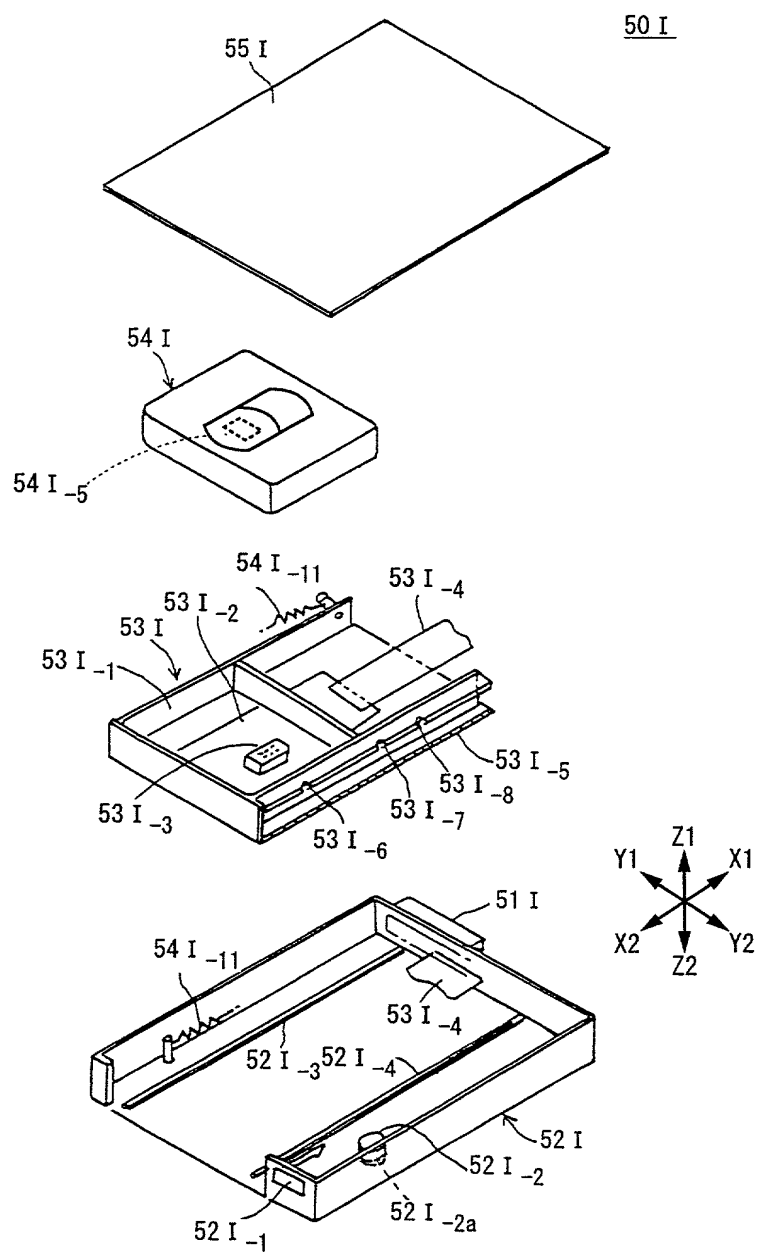


FIG. 34A

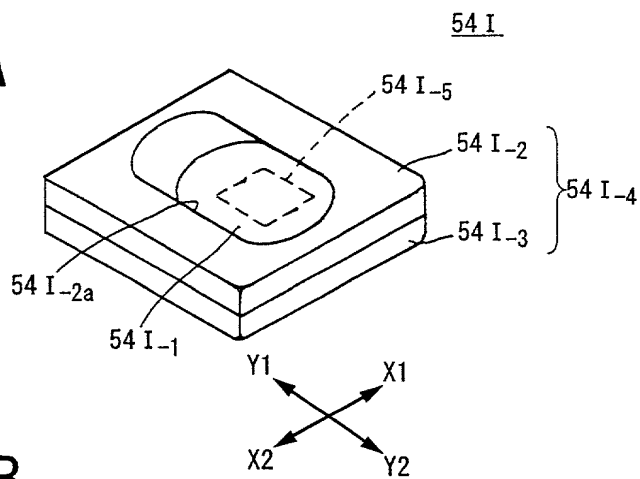
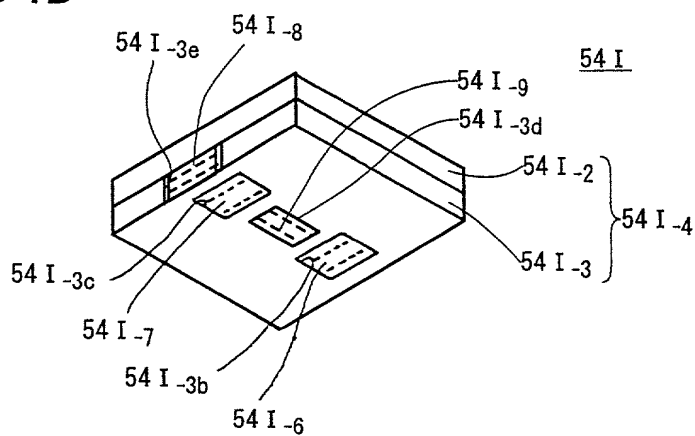


FIG. 34B



# Declaration and Power of Attorney for U.S. Patent Application

特許出願宣言書及び委任状

## Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者であると（下記の名称が複数の場合）信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

EXTENSION DEVICE PROVIDING SECURITY

FUNCTION

上記発明の明細書（下記の欄でx印がついていない場合は、本書に添付）は、

the specification of which is attached hereto unless the following box is checked:

☐ 月 日に提出され、米国出願番号または特許協定条約国際出願番号を \_\_\_\_\_ とし、  
（該当する場合） \_\_\_\_\_ に訂正されました。

☐ was filed on \_\_\_\_\_  
as United States Application Number or  
PCT International Application Number  
\_\_\_\_\_ and was amended on  
\_\_\_\_\_ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

# Japanese Language Declaration (日本語宣言書)

私は、米国法典第35編119条(a)-(d)項又は365条(b)項に基づき下記の、米国外の国の少なくとも一カ国を指定している特許協力条約365(a)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

## Prior Foreign Application(s)

外国での先行出願

as per attached

(Number)  
(番号)

(Country)  
(国名)

(Number)  
(番号)

(Country)  
(国名)

私と、第35編米国法典119条(e)項に基づいて下記の米国外の特許出願規定に記載された権利をここに主張いたします。

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

私は、下記の米国法典第35編120条に基づいて下記の米国外の特許出願に記載された権利、又は米国を指定している特許協力条約365条(c)に基づき権利をここに主張します。また、本出願の各請求範囲の内容が米国法典第35編112条第1項又は特許協力条約で規定された方法で先行する米国外の特許出願に開示されていない限り、その先行米国外出願書提出日以降で本出願書の日本国内または特許協力条約国際提出日までの期間中に入手された、連邦規則法典第37編1条56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

私は、私自身の知識に基づいて本宣言書中で私が行なう表明が真実であり、かつ私の入手した情報と私の信じることに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行えば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed

優先権主張なし

(Day/Month/Year Filed)  
(出願年月日)

(Day/Month/Year Filed)  
(出願年月日)

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.)  
(出願番号)

(Filing Date)  
(出願日)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of application.

(Status: Patented, Pending, Abandoned)  
(現況: 特許許可済、係属中、放棄済)

(Status: Patented, Pending, Abandoned)  
(現況: 特許許可済、係属中、放棄済)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

ATTACHMENT TO PAGE 2 OF Declaration and Power of Attorney

Prior Foreign Application(s)  
Patent Application

Priority  
Claimed

<u>No.11-231957</u> (Number)	<u>Japan</u> (Country)	<u>18/August/1999</u> (Day/Month/Year)	<input checked="" type="checkbox"/> [X] Yes	<input type="checkbox"/> [ ] No
<u>No.2000-232303</u> (Number)	<u>Japan</u> (Country)	<u>31/July/2000</u> (Day/Month/Year)	<input checked="" type="checkbox"/> [X] Yes	<input type="checkbox"/> [ ] No
<u>No.2000-222443</u> (Number)	<u>Japan</u> (Country)	<u>24/July/2000</u> (Day/Month/Year)	<input type="checkbox"/> [ ] Yes	<input checked="" type="checkbox"/> [X] No

Japanese Language Declaration  
(日本語宣言書)

委任状: 私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。(弁護士、または代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number)  
See list of attorneys and/or agents on page 5.

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(第三以降の共同発明者についても同様に記載し、署名をすること)

(Supply similar information and signature for third and subsequent joint inventors.)

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第六発明者の署名	日付	Sixth inventor's signature <i>Masuo Ohnishi</i>	Date July 31, 2000
住所		Residence Kawasaki, Japan	
国籍		Citizenship Japan	
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